UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

Carla M. Bard, Chairwoman
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

28 AUG 1980

Dear Ms. Bard:

We have reviewed California's water quality standards for the Sacramento-San Joaquin Delta and Suisun Marsh as contained in the Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh (Delta Plan) adopted by the State Water Resources Control Board on August 16, 1978, by means of Resolution No. 78-43. Also, we have reviewed various supporting materials including the January 25, 1979 transmittal of the Delta Plan and the February 7, 1980 transmittal of additional information to supplement the Board's 1979 transmittal.

I am pleased to inform you that I am approving California's Delta Plan as standards for these waters pursuant to Section 303(c) of the Clean Water Act. This action is based upon my determination that these water quality standards are consistent with the protection of the public health and welfare and the purposes of the Clean Water Act.

I commend the State Water Resources Control Board for its cooperation in working with the Environmental Protection Agency in developing and adopting these revised standards. With this approval, the current Federally approved water quality standards for the San Francisco Bay Basin (2) and the Sacramento-San Joaquin Delta Basin (5B) are, in addition to the Delta Plan, the following State Water Resources Control Board documents:

Sacramento-San Joaquin Delta Basin (5B)

"Water Quality Control Plan Report, Sacramento River Basin (5A), Sacramento-San Joaquin Delta Basin (5B), San Joaquin Basin (5C), Volume I", August 21, 1975, as amended, Chapters 2 and 4 ("Basin 5B Plan")

"Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California", May 18, 1972, as amended

State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California", October 1968

"Water Quality Control Policy for the Enclosed Bays and Estuaries of California," May 1974

San Francisco Bay Basin (2)

These State Water Resources Control Board documents also apply in the San Francisco Bay Basin with the exception that the "Basin 5B Plan" should be replaced by the following documents:

"Water Quality Control Plan, San Francisco Bay Basin (2), Part I", April 17, 1975, as amended, Chapters 2 and 4 ("Basin 2 Plan")

"Water Quality Control Plan for Ocean Waters of California", January 19, 1978, as amended (Ocean Plan)

The Delta Plan supersedes Figure 4-1 and the Delta salinity standards of Table 4-2, both contained in the Basin 5B Plan. Also, the Delta Plan supersedes the Chipps Island and Suisun Marsh salinity standards of the Basin 2 Plan.

In approving the Delta Plan water quality standards, it is my assumption that the interpretations stated in Enclosure 1 and the schedules for additional standards development set forth in Enclosure 2 will be followed by the Board in the development and refinement of Delta standards. To assure that no misunderstanding may occur, please confirm to me within a month of the date of this letter that these interpretations and schedules conform with the State's views. These interpretations and schedules are not intended to alter any of the conditions, interpretations or schedules of water quality standards development that are outstanding from the letters of approval for any of the previously approved standards in other policies and plans that apply to these waters.

In these continuing efforts toward developing water quality standards, it will be our pleasure to continue to work together with the State to protect the quality of California's waters.

Sincerely yours,

Paul De Falco, Jr.
Regional Administrator

Enclosures

Enclosure 1

ENVIRONMENTAL PROTECTION AGENCY
July 1980

EPA INTERPRETATIONS OF WATER QUALITY STANDARDS
SACRAMENTO-SAN JOAQUIN DELTA and SUISUN MARSH
(DELTA PLAN)

1. If two numerical values in the water quality standards conflict, the more stringent value will prevail.

2. If it is shown that there is a measurable adverse effect on striped bass spawning*, then a complete review of the Striped Bass Spawning Standard Relaxation Provision (at the Antioch Waterworks Intake when project deficiencies are imposed) (Table VI-1, page VI-31) shall commence immediately. Similarly, if any change in Suisun Marsh Chipps Island standards is proposed, as part of that standards amendment process, a review and revision of the Relaxation Provision shall commence.

3. If there is a measurable decrease** in the Striped Bass Index (SBI) below that predicted, the SWRCB shall commence immediate actions to review and revise the Delta Plan standards such that "without project" levels of protection are attained. It is our understanding that an average SBI of 79 represents "without project" protection.

---

* "A measurable adverse effect on striped bass spawning" means the following: the Striped Bass Index (SBI) for the individual year is decreased by more than 3 standard deviations from that which would otherwise be predicted using the relationships shown on Figures III-27 and III-28 of the Final EIR for Delta Plan adopted August, 1978.

** Measurable decrease means either:

(1) three consecutive years where the SBI is decreased by more than one standard deviation below that which would otherwise be predicted for each year using the relationships shown in Figures 111-27 and 111-28 of the Final EIR of the Delta Plan adopted August, 1978; or

(2) six consecutive years where the SBI is below that predicted for each year, using the above relationships.

Enclosure 2

ENVIRONMENTAL PROTECTION AGENCY
July 1980

ADDITIONAL WATER QUALITY STANDARDS DEVELOPMENT
SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH
(DELTA PLAN)

As a part of the water quality standards revision process pursuant to section 35.1550, the State shall develop additional water quality standards specified below and shall hold public hearings and shall adopt revisions to water quality standards as appropriate.

1. Through State Water Resources Control Board Resolution No. 80-18, "Adoption of a Schedule of Hearings and Actions to Resolve Outstanding Issues Related to the Bay-Delta Watershed," adopted by the Board on April 17, 1980, the Board has committed itself to review water quality issues, to develop additional water quality standards, and to adopt the developed standards. The following list of standards needs is included in work covered by Resolution No. 80-18 and shall be completed as scheduled in the Resolution:

   a. In its review of standards, the Board shall evaluate information developed on:

      1) water treatment costs for industrial processes and municipal uses;

      2) reclamation potential of wastewater;

      3) potential for crop decrement to salt sensitive tree crops and sprinkler irrigated ornamental shrubs for municipal and industrial users from the western delta; and

      4) shall develop additional standards as appropriate to protect those uses.

   b. The State has studies underway to determine the water quality needed to protect agriculture during the portion of the year between August 16 and March 30. These studies are scheduled to be completed by 1982. Additional standards to protect this beneficial use shall be developed.

   c. The State shall evaluate the ongoing negotiations between the State Department of Water Resources, Water and Power Resources Service (formerly USBR) and the South Delta Water

Agency to resolve differences in the determination of effective and acceptable means to protect southern delta agricultural use and develop additional standards to protect this beneficial use, as appropriate.

d. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from striped bass survival standards and provide more appropriate protection for other fish species and aquatic life.

e. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from Suisun Marsh standards and provide more direct protection for aquatic life in marsh channels and open waters.

f. The State has studies underway to determine the water quality needed to protect beneficial uses of San Francisco Bay. These studies are scheduled to be used in a State Board standards review in 1986. The State shall develop standards based on any early conclusions of these studies as soon as possible. These will include standards that maintain the natural periodic overturn in the South Bay to protect the designated beneficial uses of those waters. In any case extensive review of Bay salinity standards shall commence no later than 1986.

g. The State has studies underway to determine the effects of algal productivity in the estuary (including biostimulation) on water quality. These studies shall be used to develop standards to control excessive biostimulation in the estuary as soon as possible. Continued studies and modeling efforts to refine these standards shall be used to update these standards.

2. As part of the triennial review to be submitted to the State Board by August 1981, the State shall evaluate the following to determine what new or additional standards and/or plans of implementation shall be adopted to protect designated beneficial uses.

a) the water quality standards in Cache Slough at the City of Vallejo intake to restore and/or correct any deficiencies in protection of designated beneficial uses that may exist there.

b) water quality standards to protect drinking water supplies from precursors of trihalomethanes. (e.g., salinity and organic materials).

STATE OF CALIFORNIA—[illegible] AGENCY
STATE WATER RESOURCES CONTROL BOARD
P.O. BOX 100, SACRAMENTO, CALIFORNIA 95801
(916) 322-9870

EDMUND G. BROWN JR., *Governor*

PEI 12

NOV 21 1980

Ms. Sheila M. Prindiville
Acting Regional Administrator
U. S. Environmental Protection
Agency, Region IX
215 Fremont Street
San Francisco, CA 94105

Dear ~~Ms. Prindiville~~:

1978 DELTA PLAN

I was most pleased to receive your August 28 letter approving the water quality standards established by the Board's Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh. I am extremely happy EPA agrees that the water quality standards adopted by the Board for the protection of beneficial uses in the Delta and Suisun Marsh meet the stringent requirements for environmental protection established under Federal law.

You asked for Board concurrence with the interpretations and schedules set forth in Enclosures 1 and 2 of your letter. The Board has reviewed these enclosures and concurs with them. The Board has already directed staff to develop standards in the areas of concern to EPA. The schedules established by the Board in Resolution 80-18 to address important Bay-Delta issues will be modified to allow for these additional areas of study. Revision and adoption of appropriate standards will follow the process established by both State and Federal law.

Thank you for your continued cooperation in helping us solve the complex issues facing the State.

Sincerely,

Carla M. Bard
Chairwoman

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
PAUL R. BONDERSON BUILDING
901 P STREET
P.O. BOX 100
SACRAMENTO, CALIFORNIA 95801
(916) 445-1553

GEORGE DEUKMEJIAN, *Governor*

6.25.86

~~RA/DRA~~
Referred To W-1
CC: ORA
File:

JUN 23 1986

Judith E. Ayres
Regional Administrator
U.S. Environmental Protection Agency
Region 9
215 Fremont Street
San Francisco, CA 94105

Dear Ms. Ayres:

SECOND TRIENNIAL REVIEW OF THE 1978 WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH (DELTA PLAN)

In a letter dated September 16, 1985, Mr. David Jones of your staff indicated that there were a number of issues regarding the State Delta Plan submittal which needed to be discussed before EPA could take action on the SWRCB's reconfirmation of the water quality standards in this plan.

Subsequent to that time your staff has asked the Board for additional information on the striped bass survival and spawning standards. In particular, they have requested information to support the Board's findings that the water quality criteria protect the fish and wildlife beneficial uses; are based on sound scientific rationale; and contain sufficient parameters, such as toxics, to protect the designated beneficial uses. In addition, they have asked for clarification on the wording of the Board's triennial review approval resolution. EPA has questioned the consistency of this resolution with the findings in the prehearing staff report.

During the same time frame as these discussions, the Board has appointed an ad hoc toxic committee to review existing literature and studies dealing with toxic pollutants in the San Francisco Bay-Delta estuary. The main objective of this review is to differentiate flow and salinity impacts on the fishery from pollutant related impacts. Information from this study and others will be brought to the Board in the upcoming Bay-Delta hearings. In addition, the Board has scheduled five prehearing conferences in order to provide the public with the opportunity to assist the Board in refining the issues that need to be resolved in order to protect the beneficial uses of the estuary.

The decline in the Striped Bass Index clearly indicates that current standards are not adequate to protect the fishery resource. However, the Delta Plan was narrowly focused to deal only with flow and salinity impacts. Some scientists believe that pollutants (perhaps from nonpoint sources) may be playing a significant role in the decline of striped bass. Therefore, it has become increasingly evident that further coordination between the State Board's efforts to deal with water quantity issues in the estuary must be closely coordinated with the Basin Plan updates of the Regional Boards. We have already met with the Regional Boards and will continue to do so until a mutually agreeable process is developed to involve them during that part of the hearing process when evidence on pollutant impacts will be heard.

The prehearing conferences to help the Board establish the scope and issues for the Bay-Delta hearing have begun and will be concluded in June. The Board proposes adopting a workplan setting the scope, process and schedule for this hearing. This workplan should be adopted by October 1986. Any necessary modifications to the State Board triennial review resolution will be made at that time. A coordinated effort by the State and Regional Board should assure that water quality standards will be established to fully protect the designated beneficial uses of the Bay-Delta estuary.

We have kept EPA fully informed of each phase of the planning of the hearings and we will continue to keep EPA fully informed of our actions as they relate to standards concerning the Bay-Delta estuary.

Sincerely,

Raymond Walsh

Raymond Walsh
Interim Executive Director

cc: San Francisco Regional Water
Quality Control Board

Central Valley Regional Water
Quality Control Board

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

29 JUN 1987

Mr. W. Don Maughan
Chairman
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Dear Mr. Maughan:

The U.S. Environmental Protection Agency (EPA) has reviewed State Board Resolutions 85-4 and 87-7, and other relevant materials concerning the Second Triennial Review of the Water Quality Control Plan for the Sacramento/San Joaquin Delta and Suisun Marsh (Delta Plan).

Delta water quality is presently governed by four sets of standards: the Delta Plan, the Water Quality Control Plans for the Central Valley and the San Francisco Bay Basins (Basin Plans), and the Water Quality Control Policy for the Enclosed Bays and Estuaries of California (Bays and Estuaries Policy). This action concerns only the water quality standards contained in the Delta Plan.

The State Board completed the Delta Plan Second Triennial Review in January of 1985 when it adopted Resolution 85-4, and submitted the results of the review to EPA for approval on June 26, 1985. On September 18, 1985 EPA requested additional information from the Board to support certain findings, and gave the Board the opportunity to either supply this information or to modify the findings made in Resolution 85-4. Since neither the requested information nor these modifictions were forthcoming by the time the Board adopted Resolution 87-7 on February 5, 1987 (adopting the workplan for the upcoming Bay-Delta hearings), EPA is taking the following action.

EPA approves the water quality standards contained in the Delta Plan with the exception of the striped bass survival standards and the relaxation provision of the striped bass spawning standard. EPA can not approve these two standards as we believe the standards do not adequately protect the fishery resource. EPA does, however, recognize

CONCURRENCES

SYMBOL	W-3	W-3	W-1	ORC	W-1			
SURNAME	Kuhlman	Goss	SAC	Null	JB			
DATE	6/24/87	6/24/87	6/24/87	6/29/87	6/29/87			

EPA Form 1320-1 (12-70) OFFICIAL FILE COPY

that the necessary changes to these standards are difficult to specify. We also note that the State Board has embarked upon a full-scale review of the Delta Plan standards through a public hearing process. It is mandatory that this process result in standards which provide assured protection for the resource. At the termination of the hearing process, and the submission of the State's standards to EPA, EPA will at that time, take an approve or disapprove action.

In regard to the striped bass survival standards, it is important to note that one of the goals of the Delta Plan was to maintain the fishery in the estuary at levels which would have existed in the absence of the State Water Project and the Federal Central Valley Project. The striped bass was chosen by the State in 1978 as the key indicator species to be used in measuring the health of the fishery resource in the estuary. The striped bass index (SBI), was based upon a relationship between flow and young striped bass survival. This relationship was then translated into enforceable water quality standards for flow through the Delta. In order to restore and maintain the fishery at "without project" levels, these standards were established to attain a long term average SBI of 79. This specific target SBI quantitatively defines the success of the Delta flow standards in protecting the fishery. In adopting the Delta Plan, the Board determined that water quality objectives for flow and salinity alone were sufficient to protect the beneficial uses.

However, the striped bass index as measured between 1978 and 1984 was significantly below the number predicted. The validity of the correlation between flow and striped bass survival has become obscured, perhaps because either: 1) the correlation is no longer as strong as it once appeared, and hence the standard is no longer based upon sound scientific rationale; or 2) some other constituent(s) other than flow and salinity may be severely impacting the striped bass fishery. Regardless of which of these may prove to be the case, the continuing decline of the striped bass index clearly indicates the inadequacy of the existing striped bass survival standards, and the need for substantial revisions in the next Delta Water Quality Control Plan. EPA, therefore, cannot approve these standards.

As mentioned, although the cause behind the continuing decline of the striped bass index may not be clear, it is reasonable to presume that there still exists a flow-survival relationship, and that increased freshwater flows may be necessary in order to better protect the survival of young striped bass. It is EPA's position that the State Board should not allow any further incremental diversions of freshwater flows above those that are presently permitted, until the upcoming Bay-Delta water quality standards review and revision process is completed. Additionally, should the State, as a result of the hearings, decide to allow increased diversions out of the estuary, it may do so only after the necessary antidegradation requirements have been satisfied.

As for the relaxation provision of the striped bass spawning standards, we do not at this time take issue with the scientific validity of the spawning standard itself; however, the evidence for allowing a relaxation of the standard is questionable. Page VI-3 of the Delta Plan states "it may be possible to exceed these values for brief periods with little adverse effect on spawning." Since the drought years of 1976-77 when there was a long period of exceedances of adequate salinity conditions for spawning, the striped bass abundance has not recovered to levels predicted, based upon Delta outflow. While the Delta Plan was not in place at that time, EPA believes that these data have shown that the impacts of the relaxation provision were underestimated. The Board's administrative record (Delta Plan and EIR) supporting the relaxation does not provide any scientific evidence that this relaxation provision will not adversely affect spawning of striped bass. We believe that this evidence is mandatory before EPA can approve such a provision. Therefore, at this time the relaxation provision of the striped bass spawning standard is not approvable.

As we find ourselves in the midst of what will be classified as a "critical" year by the State Department of Water Resources, the issue of the relaxation provision is especially relevant. It is EPA's position that the State Board should remove the relaxation provision until such time as its appropriateness can be demonstrated. This would not preclude the adoption of a similar provision in the Water Quality Control Plan that will result from the Bay-Delta hearings that are scheduled to begin in July.

Regarding the upcoming hearings, additional areas which have been addressed in our earlier letters and which must be addressed in the upcoming hearings include the water quality needs of the Southern Delta and San Francisco Bay. Also, the recently enacted Water Quality Act of 1987 contains some new requirements which will have a direct bearing on the upcoming proceedings. Enclosures 1 and 2 contain a list of both outstanding and new issues that must be considered in the 1987-88 Delta hearings. I would recommend an early meeting between our respective staffs to discuss these issues.

EPA realizes the difficulty of establishing standards for a complex system such as the Bay-Delta estuary. Nonetheless, we have an unswerving commitment to maintain the water quality of the estuary. For this reason we have in the past urged the development of standards to provide interim protection of beneficial uses. This action serves as a recognition that, despite these historic efforts by the State, the San Francisco Bay-Delta is not being adequately protected.

We look forward to working with the State Board towards developing water quality standards for the estuary which will be truly protective of the resource, the importance of which cannot be overstated.

Sincerely,
ORIGINAL SIGNED BY:
JUDITH E. AYRES

JUDITH E. AYRES
Regional Administrator

Enclosures

cc: Executive Officer, Central Valley Regional Water Quality Control Board (w/o enclosures)
Executive Officer, San Francisco Bay Regional Water Quality Control Board (w/o enclosures)

RA - Reading File
W-1 - Reading File
W-3 - Reading File
W-3 - Official File

W-3 - J. Johnstone, Larry, 06/24/87

ENCLOSURE 1
~~ENCLOSURE 3~~

Additional Issues of Concern

A. SOUTHERN DELTA

In the Delta Water Quality Control Plan, the State Board recognized that current water supply conditions were not sufficient to reasonably protect the agricultural use of water in the Southern Delta. The major effect on water quality and quantity in the Southern Delta originates in the San Joaquin River watershed and is not a result of the Sacramento River System projects which are the subject of the corrollary water rights decision.

Currently, there is a standard of 500 mg/l TDS at Vernalis on the San Joaquin River which provides some protection to beneficial uses at that point. However, this standard is not protecting other channels which are affected by impaired water movement (for example, Tom Paine Slough and Old River near Tracy Road Bridge). As water is diverted and agricultural drainage discharged into these channels, salinities in these water bodies can reach values as high as twice those of the San Joaquin River. The water circulation in the Southern Delta is highly dependent on the water level in the channels.

On July 9, 1982, the Southern Delta Water Agency filed a lawsuit in the U.S. District Court against the USBR and DWR. The case went before the Ninth Circuit Court of Appeals on an interim appeal regarding jurisdictional questions. The case was remanded back to the District Court, and until recently was on the Court's calendar for April. However, a settlement now appears likely, and the case has been removed from the calendar.

The State Board has the jurisdiction and necessary authority to resolve this issue. Because of the ongoing and drawn-out litigation, the State Board should develop water quality standards for the Southern Delta based on its authority under State and Federal law. The State Board's decision should not be rendered meaningless by the outcome of the litigation, with the completion of a clear administrative record on its action.

The State Board's record clearly shows that the existing water quality standards are not fully protecting the beneficial uses in the Southern Delta. While there are standards established at Vernalis, additional standards for other stream segments are required to provide full protection to the Southern Delta. This issue needs to be resolved in order to have a Water Quality Control Plan that fully protects the beneficial uses.

B. SAN FRANCISCO BAY

Currently, the Delta Plan has no salinity standards established to protect the beneficial uses of San Francisco Bay. The Delta Plan stated that:

> "Unregulated outflows, particularly short bursts of moderate flows, have been found to have a substantial effect on hydraulic and salinity conditions in the Bay."

While the administrative record that was developed did not contain information which could quantify the beneficial effects of these flows, it was stated that:

> "The ecological benefits of unregulated outlows and the salinity gradients established by them have been suggested to include the following: (1) alteration of the distribution and migrations of free-swimming organisms, (2) creation of counter currents moving upstream along the bottom of the Bay which are hypothesized to be necessary for the brackish water migration of certain crabs and shrimps, and (3) transportation of young anadramous fish and maintenance of adequate food supplies."

In addition, Delta outflow has been shown to be important for providing turn-over in the South Bay. However, during the adoption of the Delta Plan in 1978, the SWRCB did not feel there

was adequate information to set specific outflow standards to protect the beneficial uses of the Bay. In order to obtain this information the San Francisco Bay-Delta Outflow Study was initiated in 1979. Additionally, hydrodynamic studies have been undertaken to model the effects of different Delta outflow conditions. When the Delta hearings are reopened, it is expected that only a preliminary understanding of the flow needs of the Bay will be available. At that time the State Board should adopt interim salinity standards based on the best available information. While it must be realized that these standards will need to be revised when further research is completed, further delays in establishing standards to protect the beneficial uses of the Bay will not be accepted.

C. WATER QUALITY ACT OF 1987

In enacting the Water Quality Act of 1987, Congress included two new sections, which EPA believes to have a very direct bearing on the upcoming Delta proceedings.

Section 308(d) of the Act amends Section 303 of the Clean Water Act and requires the State to adopt numerical standards for all toxic pollutants for which EPA has published criteria, for waters in which those pollutants can reasonably be expected to interfere with the attainment of designated uses. To control pollutants for which numerical criteria are not available, States are required to adopt standards based on biological monitoring or assessment methods to assure that no toxics are present in toxic amounts in the State's waters.

Section 308 also amends Clean Water Act §304 and requires the State to develop "individual control strategies for toxic pollutants" within two years from the Act's date of enactment (January 1987).

Additionally, the Water Quality Act of 1987 contains a section 316, which creates a new Section 319 and calls for the State to develop a "nonpoint source management program" within eighteen months.

We recognize that the State Board has decided to expand the scope of the upcoming hearings to include testimony on non-salinity related pollutants, and to develop a Pollutant Policy Document, for use by the Regional Boards in amending

their Basin Plans regarding these non-salinity pollutants within the estuary. EPA believes that inclusion of the outputs required under Sections 303, 304, and 319 into the Pollutant Policy Document would make it a more useful document than without.

Although it may not be possible for the State Board to complete all three products for all of the waters of the State within the timeframe for the development of the Pollutant Policy Document, the work to be done within the estuary and its tributaries should be prioritized so that this information is available for the Delta hearings. This information can later be incorporated into the final statewide products.

EPA staff will work with staff from the State Board to assist them in developing the information necessary for these products.

ENCLOSURE 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

Carla M. Bard, Chairwoman
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

28 AUG 1980

Dear Ms. Bard:

We have reviewed California's water quality standards for the Sacramento-San Joaquin Delta and Suisun Marsh as contained in the Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh (Delta Plan) adopted by the State Water Resources Control Board on August 16, 1978, by means of Resolution No. 78-43. Also, we have reviewed various supporting materials including the January 25, 1979 transmittal of the Delta Plan and the February 7, 1980 transmittal of additional information to supplement the Board's 1979 transmittal.

I am pleased to inform you that I am approving California's Delta Plan as standards for these waters pursuant to Section 303(c) of the Clean Water Act. This action is based upon my determination that these water quality standards are consistent with the protection of the public health and welfare and the purposes of the Clean Water Act.

I commend the State Water Resources Control Board for its cooperation in working with the Environmental Protection Agency in developing and adopting these revised standards. With this approval, the current Federally approved water quality standards for the San Francisco Bay Basin (2) and the Sacramento-San Joaquin Delta Basin (5B) are, in addition to the Delta Plan, the following State Water Resources Control Board documents:

Sacramento-San Joaquin Delta Basin (5B)

"Water Quality Control Plan Report, Sacramento River Basin (5A), Sacramento-San Joaquin Delta Basin (5B), San Joaquin Basin (5C), Volume I", August 21, 1975, as amended, Chapters 2 and 4 ("Basin 5B Plan")

"Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California", May 18, 1972, as amended

State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California", October 1968

"Water Quality Control Policy for the Enclosed Bays and Estuaries of California," May 1974

San Francisco Bay Basin (2)

These State Water Resources Control Board documents also apply in the San Francisco Bay Basin with the exception that the "Basin 5B Plan" should be replaced by the following documents:

"Water Quality Control Plan, San Francisco Bay Basin (2), Part I", April 17, 1975, as amended, Chapters 2 and 4 ("Basin 2 Plan")

"Water Quality Control Plan for Ocean Waters of California", January 19, 1978, as amended (Ocean Plan)

The Delta Plan supersedes Figure 4-1 and the Delta salinity standards of Table 4-2, both contained in the Basin 5B Plan. Also, the Delta Plan supersedes the Chipps Island and Suisun Marsh salinity standards of the Basin 2 Plan.

In approving the Delta Plan water quality standards, it is my assumption that the interpretations stated in Enclosure 1 and the schedules for additional standards development set forth in Enclosure 2 will be followed by the Board in the development and refinement of Delta standards. To assure that no misunderstanding may occur, please confirm to me within a month of the date of this letter that these interpretations and schedules conform with the State's views. These interpretations and schedules are not intended to alter any of the conditions, interpretations or schedules of water quality standards development that are outstanding from the letters of approval for any of the previously approved standards in other policies and plans that apply to these waters.

In these continuing efforts toward developing water quality standards, it will be our pleasure to continue to work together with the State to protect the quality of California's waters.

Sincerely yours,

Paul De Falco, Jr.
Regional Administrator

Enclosures

Enclosure 1

ENVIRONMENTAL PROTECTION AGENCY
July 1980

EPA INTERPRETATIONS OF WATER QUALITY STANDARDS
SACRAMENTO-SAN JOAQUIN DELTA and SUISUN MARSH
(DELTA PLAN)

1. If two numerical values in the water quality standards conflict, the more stringent value will prevail.

2. If it is shown that there is a measurable adverse effect on striped bass spawning*, then a complete review of the Striped Bass Spawning Standard Relaxation Provision (at the Antioch Waterworks Intake when project deficiencies are imposed) (Table VI-1, page VI-31) shall commence immediately. Similarly, if any change in Suisun Marsh Chipps Island standards is proposed, as part of that standards amendment process, a review and revision of the Relaxation Provision shall commence.

3. If there is a measurable decrease** in the Striped Bass Index (SBI) below that predicted, the SWRCB shall commence immediate actions to review and revise the Delta Plan standards such that "without project" levels of protection are attained. It is our understanding that an average SBI of 79 represents "without project" protection.

---

* "A measurable adverse effect on striped bass spawning" means the following: the Striped Bass Index (SBI) for the individual year is decreased by more than 3 standard deviations from that which would otherwise be predicted using the relationships shown on Figures III-27 and III-28 of the Final EIR for Delta Plan adopted August, 1978.

** Measurable decrease means either:

(1) three consecutive years where the SBI is decreased by more than one standard deviation below that which would otherwise be predicted for each year using the relationships shown in Figures III-27 and III-28 of the Final EIR of the Delta Plan adopted August, 1978; or

(2) six consecutive years where the SBI is below that predicted for each year, using the above relationships.

Enclosure 2

ENVIRONMENTAL PROTECTION AGENCY
July 1980

ADDITIONAL WATER QUALITY STANDARDS DEVELOPMENT
SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH
(DELTA PLAN)

As a part of the water quality standards revision process pursuant to section 35.1550, the State shall develop additional water quality standards specified below and shall hold public hearings and shall adopt revisions to water quality standards as appropriate.

1. Through State Water Resources Control Board Resolution No. 80-18, "Adoption of a Schedule of Hearings and Actions to Resolve Outstanding Issues Related to the Bay-Delta Watershed," adopted by the Board on April 17, 1980, the Board has committed itself to review water quality issues, to develop additional water quality standards, and to adopt the developed standards. The following list of standards needs is included in work covered by Resolution No. 80-18 and shall be completed as scheduled in the Resolution:

   a. In its review of standards, the Board shall evaluate information developed on:

      1) water treatment costs for industrial processes and municipal uses;

      2) reclamation potential of wastewater;

      3) potential for crop decrement to salt sensitive tree crops and sprinkler irrigated ornamental shrubs for municipal and industrial users from the western delta; and

      4) shall develop additional standards as appropriate to protect those uses.

   b. The State has studies underway to determine the water quality needed to protect agriculture during the portion of the year between August 16 and March 30. These studies are scheduled to be completed by 1982. Additional standards to protect this beneficial use shall be developed.

   c. The State shall evaluate the ongoing negotiations between the State Department of Water Resources, Water and Power Resources Service (formerly USBR) and the South Delta Water

Agency to resolve differences in the determination of effective and acceptable means to protect southern delta agricultural use and develop additional standards to protect this beneficial use, as appropriate.

d. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from striped bass survival standards and provide more appropriate protection for other fish species and aquatic life.

e. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from Suisun Marsh standards and provide more direct protection for aquatic life in marsh channels and open waters.

f. The State has studies underway to determine the water quality needed to protect beneficial uses of San Francisco Bay. These studies are scheduled to be used in a State Board standards review in 1986. The State shall develop standards based on any early conclusions of these studies as soon as possible. These will include standards that maintain the natural periodic overturn in the South Bay to protect the designated beneficial uses of those waters. In any case extensive review of Bay salinity standards shall commence no later than 1986.

g. The State has studies underway to determine the effects of algal productivity in the estuary (including biostimulation) on water quality. These studies shall be used to develop standards to control excessive biostimulation in the estuary as soon as possible. Continued studies and modeling efforts to refine these standards shall be used to update these standards.

2. As part of the triennial review to be submitted to the State Board by August 1981, the State shall evaluate the following to determine what new or additional standards and/or plans of implementation shall be adopted to protect designated beneficial uses.

a) the water quality standards in Cache Slough at the City of Vallejo intake to restore and/or correct any deficiencies in protection of designated beneficial uses that may exist there.

b) water quality standards to protect drinking water supplies from precursors of trihalomethanes. (e.g., salinity and organic materials).

WORKPLAN
FOR THE HEARING PROCESS
ON THE SAN FRANCISCO BAY / SACRAMENTO - SAN JOAQUIN DELTA ESTUARY

FEBRUARY 5, 1987

STATE WATER RESOURCES CONTROL BOARD

WORKPLAN FOR THE HEARING PROCESS ON THE SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY (BAY-DELTA HEARING PROCESS)

The purpose of this workplan is to describe the nature and conduct of the Bay-Delta hearing. The hearing process described in this workplan was developed from the public comments and recommendations received by the Board during six prehearing conferences, the comment period held thereafter, and the appellate court decision on the Decision 1485 Delta Water Cases. The State Board members would like to take this opportunity to thank all the prehearing conference participants for their valuable input on this important process.

Prepared By
Bay-Delta Program
Division of Water Rights
State Water Resources Control Board

February 5, 1987

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 87-7

ADOPTION OF THE "WORKPLAN FOR THE HEARING PROCESS ON THE SAN FRANCISCO BAY/ SACRAMENTO-SAN JOAQUIN DELTA ESTUARY"--DATED FEBRUARY 5, 1987

WHEREAS:

1. The State Board, in August 1978, adopted a water quality control plan for the Sacramento-San Joaquin Delta and Suisun Marsh (Delta Plan) to protect beneficial uses of water in the Sacramento-San Joaquin Delta and Suisun Marsh and to provide for necessary studies to develop reliable information regarding the fresh water inflow needs of the San Francisco Bay.

2. Pursuant to Section 303(c) of the Clean Water Act, the State Board must complete a triennial review of the water quality standards in the Delta Plan.

3. In April 1980, the State Board adopted Resolution No. 80-18 specifying a schedule of hearings and actions to resolve outstanding issues relative to the Delta Plan.

4. On September 22, 1981 and November 7, 1984, the State Board held public hearings to review and consider the adequacy of the water quality standards in the Delta Plan.

5. The State Board intends to open a new hearing in July 1987 to consider revisions to the water quality standards contained in the Delta Plan and new standards for San Francisco Bay.

6. The scope of the Delta Plan is limited to flow and salinity related issues, while nonsalinity related pollutant and toxic issues are addressed by the Regional Boards in the Basin Plans.

7. The workplan for the forthcoming hearing outlines a process, scope and schedule the State Board and the Regional Water Quality Control Boards (San Francisco Bay Basin and Central Valley Basin) will use to address the effects of flow, salinity and pollutants on the beneficial uses of the Bay-Delta Estuary.

Table of Contents

WORKPLAN FOR THE BAY-DELTA HEARING PROCESS

1.0 INTRODUCTION

1.1 BACKGROUND

The San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Estuary) includes the Sacramento-San Joaquin Delta (Delta), Suisun Marsh and San Francisco Bay. The Delta is composed of about 738,000 acres, of which about 48,000 acres are water surface area; Suisun Marsh comprises approximately 85,000 acres of marshland and waterways. San Francisco Bay includes about 306,400 acres of water surface area. The Delta and Suisun Marsh are located where California's two major river systems (the Sacramento and San Joaquin River systems) converge to flow westward, meeting incoming seawater from the Pacific Ocean through San Francisco Bay. The Bay-Delta Estuary is one of the largest, most important estuarine systems for fish and waterfowl production on the Pacific Coast of the United States. In addition, the Delta is one of the State's most fertile and important agricultural regions and is the location of a major water-related industrial corridor in the vicinity of Antioch.

The watershed of the Bay-Delta Estuary provides about two-thirds of all the water used in California including 40 percent of the state's drinking water. Two major water distribution systems, one state and one federal, export supplies from the Delta to areas of use. These systems are the State Water Project (SWP), operated by the California Department of Water Resources (Department), and the Central Valley Project (CVP), operated by the U.S. Bureau of Reclamation (Bureau). Numerous other water development projects also alter the river inflows into the Bay-Delta Estuary.

Because of the configuration of the Delta, the water from the Sacramento River and its tributaries that is exported south and west of the Delta must flow through the Delta into the channels of the lower San Joaquin River system to reach the SWP and CVP export pumps in the southern Delta. Because of this circuitious route,

"carriage water", which becomes Delta outflow to the ocean, is required in order to repel ocean salinity and maintain the quality of the water on its way to the export pumps. This water protects the quality of exported water. This water also helps protect the beneficial uses in the Delta.

1.2 REGULATION OF WATER QUALITY IN THE BAY-DELTA ESTUARY

Between 1958 and 1970 the State Water Resources Control Board issued water right permits to the Bureau and the Department which authorize the two agencies to divert water by direct diversion or by rediversion from the Delta for transportation to the areas south and west of the Delta. During the period when the permits were being issued, the State Board recognized that diversion of water under the permits would have an uncertain effect on the salinity in the Bay-Delta Estuary. To ensure adequate protection the Board reserved jurisdiction in the CVP and SWP permits until the effects of project operations were better understood. As those effects have been better understood, the Board has imposed conditions for salinity control in the Delta and coordinated the terms and conditions of the various CVP and SWP permits that affect the Delta. The Board also reserved jurisdiction in several permits to protect fish and wildlife in the Delta.

The Board first exercised its reserved jurisdiction over the CVP and SWP permits to impose Delta salinity requirements on the CVP and SWP in Water Right Decision 1379, adopted July 28, 1971.

Under its water quality authority, the Board's predecessor first regulated the quality of water in the Delta and in Suisun Marsh in its 1967 Water Quality Control Policy, which was amended in 1968 by the State Board. In 1971 the Regional Water Quality Control Boards for the San Francisco Bay Basin and the Central Valley Basin (Regions 2 and 5), adopted interim water quality control plans for their respective parts of the Estuary. (Regular plans were approved for the two regions in 1975.) In 1973 the State Board supplemented its 1967 Water Quality Control Policy for the Delta. In 1976 the Board commenced a joint water right and water quality hearing to coordinate salinity standards for the Delta and Suisun Marsh in both a water quality control plan and in the water right permits of the SWP and CVP. The basis of the water right proceeding was the reservation of jurisdiction the Board had

previously placed in the SWP and CVP permits to control salinity in the Estuary. The hearing culminated in the adoption in 1978 of Water Right Decision 1485 (D-1485) and a Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh (Delta Plan). The 1978 Delta Plan contains water quality standards for salinity only.

In November of 1983 the Board adopted Water Right Decision 1594. This decision concerns recent water right permittees (not related to the CVP and SWP), over which the Board had retained appropriate jurisdiction (since about 1965).

The 1978 decisions and Decision 1594 are the immediate predecessors of the forthcoming proceeding, which will expand to the entire Bay-Delta Estuary the area that will be considered for protection of beneficial uses (including uses protected by public trust) in the water quality control plan. The forthcoming proceeding also will expand consideration of the responsibilities of water right holders to meet the standards, from just the two projects to all post-1914 water right holders, and pre-1914 and riparian water right holders, who are upstream from the Bay-Delta Estuary and within the watershed of the Estuary. Further, it will provide a forum for the Regional Boards for the San Francisco Bay and Central Valley to receive evidence on pollutants in the Estuary, to use in amending their respective basin plans for the Estuary.

1.3 SOME LAWS THAT AFFECT THE BOARD'S AUTHORITY TO CONDUCT THE FORTHCOMING PROCEEDING AND THE BOARD'S DECISION MAKING

The Board's authority to conduct a new proceeding to set water quality standards for the Bay-Delta Estuary and to implement the standards by amending water rights is founded on several statutes and case laws. These include:

a. Water Code Section 13170, (State Board authority to adopt water quality control plans).

303(e)

b. The federal Clean Water Act, at Section 303(e), (Federal requirements related to the preparation of water quality control plans).

c. Reserved jurisdiction in permits of the CVP, SWP, and in permits of new appropriators since about 1965 within the watershed to add specific terms and conditions.

d. Continuing jurisdiction to amend all water right permits and licenses under, Cal. Const. Art. X, Section 2; Water Code Sections 100, 275, 1050; United States v. State Water Resources Control Board (1985) 182 Cal.App.3d 82, 129, 227, Cal. Rptr. 161.

e. Continuing jurisdiction to reexamine all permits and licenses under the public trust doctrine. National Audubon Society v. Superior Court (1983) 33 Cal.3d 419, 447, 189 Cal.Rptr. 346.

f. The Delta Protection Act, at Water Code Sections 12200-12220, the Watershed of Origin protections at Water Code Sections 11460-11463, the County of Origin protections at Water Code Sections 10505 and 10505.5, and the San Joaquin River protection act, at Water Code Sections 12230-12233.

1.4 OBJECTIVES OF THE BAY-DELTA HEARING PROCESS

The principal focus of the 1978 Delta Plan and D-1485 was on the effects of the operation of the state and federal water projects on the Estuary. These effects were to be reviewed again by 1988. The Board recognized that there were uncertainties associated with possible new SWP and CVP facilities. Also there was a recognized need for additional ecological and hydrological information on the Bay-Delta Estuary.

In the forthcoming proceeding the Board will review, broaden and refine the water quality standards of the Bay-Delta Estuary to provide reasonable levels of protection for beneficial uses insofar as they are affected by conditions of flow, salinity and pollutants. 1/ This will be done in cooperation with the Regional Water Quality Control Boards 2 and 5.

1/ For the purpose of this proceeding, "pollutants" are defined as organic and inorganic substances (other than ocean derived salinity) which may arise from point and non-point sources.

uh oh!

Once estuarine water quality and salinity standards have been reviewed and revised (if necessary), the Board will then determine if it is necessary to amend water rights in order to achieve, or progress toward the achievement of those standards. This final decision will require careful evaluation, balancing and protection of the beneficial uses within and outside the Bay-Delta Estuary.

Evidence received on pollutants will be used by Regional Boards 2 and 5 to update their basin plans. The State Board will provide guidance to the Regional Boards in the development of pertinent provisions of these plans and will review and approve Regional Board updates as part of the coordinated actions. During the final phase of the hearing, the Board will evaluate whether the source control of pollutants proposed by the Regional Boards is sufficient to protect beneficial uses in the Estuary. The Board may consider the need for dilution or flushing flows through water right amendments only after all reasonable source control methods have been implemented and only if the Board finds it to be in the public interest.

2.0 SCHEDULE AND SCOPE FOR THE BAY-DELTA HEARING

2.1 SCHEDULE OF ACTIVITIES

The proposed schedule for the Bay-Delta hearing process (Plate 1) has been drafted taking into account the appellate court decision on the D-1485 Delta water cases and comments and recommendations made by individuals, local interest groups and local, state and federal agencies during a series of prehearing conferences held in May, June and July, 1986. The schedule for the hearing is divided into three distinct hearing phases (also refer to Plate 1). Phase I is scheduled to commence in July 1987. Phase II is estimated to start in July 1988. Phase III is estimated to start in April 1989.

A. Phase I Scope of the Hearing--Determination of Reasonable Levels of Protection

Evidence will be received on the following subjects during Phase I: 2/

2/ See Table I, Topics for the Bay-Delta Hearing, page 33.

(1) The beneficial uses within and outside of the Bay-Delta Estuary;

(2) The reasonable protection in terms of flow and salinity levels that the beneficial uses should be given, considering the uses of the water within and outside of the Estuary; 3/

(3) The impacts of pollutants (other than salinity) on the beneficial uses;

(4) The means for implementing any flow or salinity objectives that are set for the Bay-Delta Estuary; and

(5) The means for identifying and mitigating any adverse impacts on the beneficial uses that may result from pollutants.

The evidence should be framed so that it is useful for differentiating the effects of salinity on the beneficial uses from the effects of pollutants on those beneficial uses. This will allow the State Board to establish flow and salinity objectives which mitigate solely for the effects of changes in flow and salinity.

The evidence regarding pollutants should also be framed so as to be useful to the Regional Water Quality Control Boards for Regions 2 and 5 in their preparation of amendments to their water quality control plans that cover the Bay-Delta Estuary. The State Board will provide guidance to the Regional Boards in a state policy on the control of pollutants in the Bay-Delta Estuary. (Also refer to Section 2.2 for a discussion on Regional Board participation in the hearing process.)

3/ Additional evidence regarding beneficial uses outside the Estuary will be appropriate in Phase III.

Evidence received in Phase I will have four uses. First, it will be used to prepare a draft salinity control plan. Second, it will be used together with evidence received during the third phase of the hearing to prepare a water right decision. Third, it will be used by the State Board to develop a pollutant policy document which will provide guidance to Regional Water Quality Control Boards 2 and 5 in the review of their water quality control plans that cover the Bay-Delta Estuary. Fourth, it will be used by the Regional Boards to review and amend their plans.

Evidence for Phase I should be designed to facilitate development of the salinity plan and to allow for consideration of discharge of pollutants into the Estuary. Evidence concerning uses outside the Estuary, to determine reasonable levels of protection, should include such matters as the amounts of water used in a regional area, the types of uses, projections of future needs, and amounts of water produced within the Bay-Delta hydrologic basin. The salinity control plan, the pollutant policy document, and the regional boards' plan amendments will not allocate water. (Water allocation will occur after the Phase III hearing which will include the Phase I hearing record and sufficient additional evidence upon which to base an allocation decision.)

B. Phase II Scope of The Hearing--Review of the Draft Salinity Control Plan and Pollutant Policy Document

Prior to Phase II, Board staff, in consultation with State and Regional Board members involved in the Phase I hearing will prepare a salinity control plan and a pollutant policy document for review by the hearing participants. The purpose of Phase II is to consider the draft salinity plan and the pollutant policy document. The draft plan will contain: (1) an identification of beneficial uses of Bay-Delta waters; (2) objectives to reasonably protect the beneficial uses identified in Phase I from adverse salinity and flow effects; (3) a program of implementation for the flow and salinity objectives; and (4) an analysis of the environmental impacts of the draft plan. The program of implementation will contain the types of implementation measures the Board will consider to achieve a reasonable set of flow and salinity

objectives. Part of this consideration in the program of implementation will be a review of the responsibilities of all appropriators to protect the beneficial uses of Bay-Delta waters. Such a review in detail is the subject of Phase III of the hearing.

The pollutant policy document will set forth State policy on regulation of pollutants in the Bay-Delta Estuary. This policy will be developed based upon the evidence received during Phase I on the adverse impacts of pollutants on beneficial uses. Guided by this policy, the San Francisco Bay Basin and Central Valley Basin Regional Boards (2 and 5) will conduct an update of their basin plans.

Phase II of the hearing will be conducted apart from Phases I and III, as a quasi-legislative hearing. In Phase II, testimony will not be sworn nor witnesses cross-examined. After Phase II, the Board expects to prepare and adopt a final salinity control plan and pollutant policy document.

C. Phase III Scope of the Hearing--Consideration of the Impacts of the Alternatives and Receipt of Other Information Needed for a Water Right Decision

Prior to Phase III, and after adoption of a final salinity control plan, Board staff will prepare and issue for review a set of alternatives for implementing the objectives in the salinity control plan through a new water right decision. During Phase III of the hearing, the Board will receive evidence on the set of alternatives and any other alternative(s) recommended by any party.

Relevant evidence in Phase III will include: (1) detailed hydrologic studies of the relationships between flow and salinity 4/; (2) reasonableness of alternatives for protecting uses of Bay-Delta waters; (3) protecting rights to Bay-Delta waters; (4) the impacts of various attainment alternatives that will be provided by the Board's staff before Phase III; (5) evidence relevant to the petition of the United States Bureau of Reclamation to add the SWP Banks Pumping Plant as a point of diversion and

---

4/ General hydrologic studies will be received during Phase I.

rediversion and increase the diversion rate; (6) evidence relevant to the effects of the federal Central Valley Project and State Water Project on the Southern Delta; (7) the effects on beneficial uses outside the Estuary of implementing water quality objectives by modifying water rights; and (8) any other evidence that is relevant to reasonable attainment of water quality objectives contained in the salinity control plan.

D. Final Determinations

After the close of the Phase III hearing, the Board will develop and circulate a draft environmental impact report and may hold a hearing on the EIR. Thereafter, a public Board meeting will be held in which the Board will certify the final EIR and adopt a water right decision about July 1990.

2.2 REGIONAL BOARD PARTICIPATION IN THE HEARING PROCESS

The Bay-Delta Estuary is a hydrologically continuous water body whose beneficial uses are subject to the combined effects of flow, salinity and pollutants. The State Board has therefore decided to receive evidence on the adverse impacts of pollutants on beneficial uses of the Bay-Delta Estuary during the first phase of the hearing process. Because the Regional Water Quality Control Boards are responsible under the Porter-Cologne Act to formulate, adopt, review and revise water quality control plans for the hydrologic basins within their area of jurisdiction, the State Board has invited the Regional Water Quality Control Boards of the San Francisco Bay Basin and Central Valley Basin (Regional Boards 2 and 5) to participate in the hearing process.

Through their participation, the Regional Board representatives will assist the State Board in differentiating the salinity induced impacts on beneficial uses from those caused by pollutants and will present relevant water quality data. The Regional Boards will also update their respective basin plans based upon the evidence they receive during the hearing. To assure uniformity of objectives and programs of implementation in the Regional Board basin plans before they are updated, the State Board will coordinate the activities of each Board and develop a pollutant policy document which will set forth State policy on regulation of pollutants in the Bay-Delta

Estuary. Regional Board representatives will participate in reviewing comments on the draft pollutant policy document during Phase II, before it is adopted by the State Board. Subsequently, Basin Plan amendments will be submitted to the State Board prior to Phase III for review and approval.

Plate 2, "Schematic of the State Board Bay-Delta Hearing Process and Regional Board Involvement" and the accompanying narrative, provides a detailed description of Regional Board cooperation. The reader is advised to review this schematic for a more detailed explanation on Regional Board participation.

2.3 OVERVIEW OF THE HEARING PROCESS

The information that will be presented to the Board during this hearing process will be complex and cover many diverse topics. In order to receive this information in a manner most helpful to the Board, a structured hearing process has been formulated. As discussed above, the evidentiary hearing will be divided into three phases. Specific topics will be discussed in each phase of the hearing as noted in Section 3.0 (pages) (also see Table 1, page). Time slots will be set aside for the discussion of each topic. For example, for topics listed under Phase I, a different number of hearing days will be alloted for agricultural uses, for municipal and industrial uses, for wildlife, salmon fishery, etc. Organizing the hearing according to topic will help to assure a clear record and should help many of the parties to concentrate their efforts. However, it will require some parties to divide their testimony into parts rather than presenting it all at one time. The amount of time set aside for each topic will be set as soon as the Board knows the estimated time each party requests to present testimony on each topic. The time required for cross-examination will be roughly estimated and a flexible number of days will be available for each topic.

3.0 BAY-DELTA HEARING TOPICS & ISSUES

The issues listed in this part are not inclusive and are not intended to exclude other issues relevant to the topics listed in this part. In particular, while we have set aside a topic in Phase I in which pollutants will be emphasized, and in which we want most of the evidence on pollutants, we will not exclude relevant nonrepetitive evidence regarding pollutants during time slots set aside for other topics in Phase I.

Through Phase I, the Board seeks evidence that can be used to develop water quality objectives. For purposes of this hearing, "water quality objectives" include flow levels, salinity objectives, and pollutant objectives.

3.1 PHASE I: TOPICS AND ISSUES--DETERMINATION OF REASONABLE LEVELS OF PROTECTION FOR THE BAY-DELTA'S BENEFICIAL USES

TOPIC

1. Hydrologic Conditions

This topic covers several subjects that the Board will consider when developing reasonable water quality objectives for maintaining beneficial uses in the Bay-Delta Estuary. Specifically, the Board will hear evidence on the following:

a. Hydrologic conditions that parties recommend for consideration in developing water quality objectives for Bay-Delta beneficial uses.

b. The water quality conditions in the Bay-Delta Estuary under the present level of development upstream and in the Estuary.

c. The flow and salinity in the Bay-Delta Estuary under natural flow conditions. 5/

5/ Natural flow conditions--flow entering the Estuary under the present channel configuration, assuming no impairment or enhancement of flow.

The following issues are associated with these subjects.

Issues

- What are the existing water quality conditions in the Bay-Delta Estuary?
- How have hydrology and salinity conditions in the Bay-Delta Estuary changed as a result of upstream development?
- What are the effects of Delta inflow and outflow on salinity?
- What are the flows and salinities in the Bay-Delta Estuary under natural flow conditions?
- Should water year types of individual major basins contributing flows to the Delta be considered in determining flow and salinity objectives for the Bay-Delta Estuary? How can this be accomplished?
- Should water year types be used as a measure for adjustment of flow and salinity objectives in the Bay-Delta Estuary? Should a sliding scale be used instead of the stair-step method used in Water Right Decision 1485?
- What period of record should the Board use in estimating hydrologic and salinity conditions?

TOPIC

2. Uses Within the Bay-Delta Estuary

A. Agricultural Uses (Northern, Southern, Central and Western Delta)

Testimony and evidence will be received regarding the objectives that parties believe will provide reasonable protection of Delta agriculture.

Issues

- What specific water levels are needed in Delta channels to accommodate diversion for irrigation?
- What are the short and long-term water quality needs (for both irrigation and leaching) of significant salt sensitive crops in the different agricultural areas of the Delta? What are these crops?
- What is the appropriate use of the results of the "Delta Corn Study" in determining agricultural water quality objectives?
- What are the agricultural management practices the Board should consider when developing flow and salinity objectives for the different areas of the Delta?
- What actions in addition to the establishment of water quality objectives should the Board or Regional Boards 2 and 5 consider to achieve reasonable levels of protection for agricultural uses?
- At what locations should water quality objectives be established and measured?

B. Municipal and Industrial Uses

Evidence will be received on the effects of water quality on Bay-Delta municipal and industrial uses of water. Evidence will also be received on the reasonable water quality objectives parties believe will ensure protection of these beneficial uses.

Issues

- What are the adverse effects of salinity and organics on municipal and industrial uses of water (including the formation of trihalomethanes in the water treatment process)? How can these effects be lessened with alternative forms of water treatment?

- What are the reasonable municipal and industrial water quality objectives for the Bay-Delta Estuary?

- What actions in addition to the establishment of water quality objectives should the Board or Regional Boards 2 and 5 consider to achieve reasonable levels of protection for municipal and industrial uses?

- At what locations should water quality objectives be established and measured?

C. Wildlife

Evidence on the types of wildlife within the Bay-Delta Estuary will be received. Evidence will also be received on the reasonable needs of wildlife.

Issues

- What types of wildlife inhabit the Bay-Delta Estuary?

- Are there any wildlife species other than migrating and resident waterfowl that the Board should consider as a basis for setting reasonable water quality objectives?

- What recreational, economic and other factors should be considered by the Board in developing reasonable levels of protection for wildlife?

- What are reasonable levels of protection for wildlife of the Bay-Delta Estuary?

- What are reasonable water quality objectives for wildlife of the Bay-Delta Estuary?

- What actions in addition to the establishment of water quality objectives should the Board or Regional Boards 2 and 5 consider to achieve reasonable levels of protection for wildlife resources?

- At what locations should water quality objectives be established and measured?

D. Striped Bass Fishery

Evidence regarding Delta flow, salinity, pollution, diversions and survival relationship of young striped bass will be received. The importance of other factors such as phytoplankton, zooplankton, and egg production will also be heard. Evidence will be received on the reasonable levels of protection to be provided young and adult striped bass.

Issues

- How do Delta flows and diversions affect the abundance of young striped bass?

- What is the importance of phytoplankton, zooplankton, striped bass egg production and other factors to the abundance of young striped bass?

- What is the relationship between the numbers of young striped bass and the numbers of adult striped bass recruited into the fishery?

- What recreational, economic and other factors should be considered by the Board in developing reasonable levels of protection for the striped bass fishery?

- What are the reasonable levels of protection for striped bass in the Bay-Delta Estuary?

- What are the reasonable water quality objectives for striped bass in the Bay-Delta Estuary?

- What actions in addition to the establishment of water quality objectives should the Board or Regional Boards 2 and 5 consider to achieve reasonable levels of protection for striped bass?

- At what locations should water quality objectives be established and measured?

E. Chinook Salmon Fishery

Evidence regarding salinity, Delta flow, diversions, pollutants, habitat requirements, and survival relationships for chinook salmon will be received. Evidence on the reasonable levels of protection to be provided young and migrating adult chinook salmon will be received.

Issues

- How do Delta flows and diversions affect the abundance of chinook salmon?

- What is the importance of phytoplankton, zooplankton, chinook salmon spawning requirements and other factors to the abundance of young salmon?

- What is the relationship between the numbers of young chinook salmon and the numbers of adult chinook salmon recruited into the fishery?

- What recreational, economic and other factors should be considered by the Board in developing reasonable levels of protection for chinook salmon?

- What are the reasonable levels of protection for chinook salmon using the Bay-Delta Estuary?

- What are the reasonable water quality objectives for chinook salmon in the Bay-Delta Estuary?

- What actions in addition to the establishment of water quality objectives should the Board or Regional Boards 2 and 5 consider to achieve reasonable levels of protection for chinook salmon?

- At what locations should water quality objectives be established and measured?

F. Other Migrating and Resident Fish

Evidence regarding the effects of flow, salinity, pollutants and diversions on other types of migrating and resident fish in the Bay-Delta Estuary will be received. Evidence on reasonable levels of protection to protect these species will also be received.

Issues

- What other migrating and resident fish of the Bay-Delta Estuary should be specifically accorded reasonable levels of protection?

- How do Delta flows and diversions affect the abundance of other migrating and resident fish?

- What recreational, economic and other factors should be considered by the Board in developing reasonable levels of protection for other migrating and resident fish of the Bay-Delta Estuary?

- What are the reasonable levels of protection for other migrating and resident fish of the Bay-Delta Estuary?

- What are the reasonable water quality objectives for other migrating and resident fish of the Bay-Delta Estuary?

- What actions in addition to the establishment of water quality objectives should the Board or Regional Boards 2 and 5 consider to achieve reasonable levels of protection for other migrating and resident fish?

- At what locations should water quality objectives be established and measured?

TOPIC

3. Uses Within Export Areas

Under this topic the Board wishes to receive evidence regarding the State Water Project, the Federal Central Valley Project, reservoir operations, and other export uses of water. This topic includes uses of water in export areas, and estimates of future water demand. Evidence also will be received regarding alternative sources of water to meet existing and future demands. As part of this topic the Central Valley Project is asked to provide evidence regarding the effect on water uses of the changes it has proposed in its operations, including those proposed in the Coordinated Operations Agreement.

The evidence provided under this topic should provide region-wide statistics and estimates of the amount of water going to various uses. The evidence should be sufficiently detailed to allow the Board to take a global perspective of the state's water uses in determining the reasonable levels of protection for all the beneficial uses of the waters. In accordance with the appellate court decision, consideration of the allocation of water must be separated from the consideration of water quality standards for the Estuary. Therefore, the basis of water quality standards will be addressed in Phase I and the water allocation process will result from Phase III.

A. Agricultural Uses

What are the types and amounts of agricultural water use within the export areas?

Issues

- How much water from the Delta is needed to support current agricultural uses within export areas, taking into consideration market economics, water conservation measures, and alternative sources of supply?

- How much water from the Delta will be needed to support projected agricultural uses within export areas, taking into consideration market economics, water conservation measures, and alternative sources of supply?

- What are the alternative sources of water available to meet existing and future agricultural water demands within the export areas?

- What is the relationship between proposed changes in the operation of exporters to agricultural areas, including the Central Valley Project and State Water Project and future demands for exported water?

B. Municipal and Industrial Uses

Issues

- What are the types and amounts of municipal and industrial water use within the export areas?

- How much water from the Delta is needed to support current municipal and industrial uses within export areas, taking into account market economics, water conservation measures, and alternative sources of supply?

- How much water from the Delta will be needed to support projected municipal and industrial uses within export areas, taking into account market economics, water conservation measures, and alternative sources of supply?

- What are the alternative sources of water available to meet existing and future municipal and industrial water demands within the export areas?

- What is the relationship between proposed changes in the operation of exporters to municipal and industrial areas, including the Central Valley Project and State Water Project and future demands for exported water?

C. Other Uses

- What are the types and amounts of other water uses within the export areas?

- How much water from the Delta is needed to support current beneficial uses within export areas, taking into consideration market economics, water conservation measures, and alternative sources of supply?

- How much water from the Delta will be needed to support other projected beneficial uses within export areas, taking into account market economics, water conservation measures, and alternative sources of supply?

- What are the alternative sources of water available to meet other existing and future water demands within the export areas?

- What is the relationship between proposed changes in the operation of exporters for use other than agriculture, municipal and industrial, including the Central Valley Project and State Water Project and future demands for exported water?

TOPIC

4. Uses Upstream of the Bay-Delta Estuary

Under this topic the Board wishes to receive evidence regarding upstream water uses, reservoir operations, the State Water Project, the federal Central Valley Project, and other uses of water within the Bay-Delta hydrologic basin and estimates of future water demand. Evidence also will be received regarding alternative sources of water to meet existing and future demands. As part of this topic the Central Valley Project is asked to provide evidence regarding the effect on water uses of the changes it has proposed in its operations.

The evidence provided under this topic should include region-wide statistics and estimates of the amount of water going to various uses. The evidence should be sufficiently detailed to allow the Board to take a global perspective of the state's water uses in determining the reasonable

levels of protection for the Estuary. However, consideration of the allocation of water must be separated from the consideration of water quality standards for the Estuary and will occur during Phase III.

A. Agricultural Issues

Issues

- What are the types and amounts of agricultural water use upstream of the Bay-Delta Estuary?
- How much water is needed to support current agricultural uses upstream of the Bay-Delta Estuary, taking into consideration market economics, water conservation measures and alternative sources of supply?
- How much water will be needed to support projected agricultural uses upstream of the Bay-Delta Estuary, taking into consideration market economics and alternative sources of supply?
- What are the alternative sources of water available to meet existing and future agricultural water demands upstream of the Bay-Delta Estuary?

B. Municipal and Industrial

Issues

- What are the types and amounts of municipal and industrial water use upstream of the Bay-Delta Estuary?
- How much water is needed to support current municipal and industrial uses upstream of the Bay-Delta Estuary, taking into consideration market economics, water conservation measures and alternative sources of supply?
- How much water will be needed to support projected municipal and industrial uses upstream of the Bay-Delta Estuary, taking into consideration market economics, water conservation measures and alternative sources of supply?

- What are the alternative sources of water available to meet existing and future municipal and industrial water demands upstream of the Bay-Delta Estuary?

C. Other Uses

Issues

- What are the types and amounts of other water uses upstream of the Bay-Delta Estuary?

- How much water will be needed to support current beneficial uses upstream of the Bay-Delta Estuary, taking into consideration market economics, water conservation measures and alternative sources of supply?

- How much water will be needed to support other projected beneficial uses upstream of the Bay-Delta Estuary taking into account market economics, water conservation measures and alternative sources of supply?

- What are the alternative sources of supply available to meet other existing and future water demands upstream of the Bay-Delta Estuary.

TOPIC

5. Impacts of Freshwater Inflow on San Francisco Bay

Evidence will be received to evaluate the impacts of annual and pulse freshwater inflows on the beneficial uses of San Francisco Bay and the protection of those uses.

Issues

- What are the various beneficial uses and key organisms of San Francisco Bay which can be shown to be influenced by freshwater inflows?

- What are the relationships between the Bay's beneficial uses, including the key organisms inhabiting the Bay, and freshwater inflow?

- What are the ecological benefits of freshwater inflows for key organisms inhabiting San Francisco Bay?

- What are the relationships between freshwater inflow and the abundance of key organisms inhabiting San Francisco Bay?

- What recreational, economic and other factors should be considered in the development of reasonable levels of protection for the beneficial uses of San Francisco Bay?

- What are the reasonable levels of protection the Board should consider for the various beneficial uses of San Francisco Bay?

- What are the water quality objectives the Board should consider for the various beneficial uses of San Francisco Bay?

- At what locations should water quality objectives be established and measured?

TOPIC

6. Pollutants in the Bay-Delta Estuary
(See statement under paragraph 3.0)

Evidence on impacts of pollutants is an important topic during Phase I of the Bay-Delta hearing. The Bay-Delta Estuary is a hydrologically continuous water body whose beneficial uses are subject to the combined effects of flow, salinity and pollutants. Evidence received on this topic will be used in three ways.

a. To differentiate to the extent practical the effects of flow and salinity on beneficial uses from the effects of pollutants; and

b. To provide the Central Valley and San Francisco Bay Regional Water Quality Control Boards with a Bay-Delta wide scope of current information upon which they can base timely revisions to their water quality control plans (basin plans), prior to the beginning of the Phase III hearing record; and

c. To prepare a pollutant policy document for the guidance of the two Regional Boards in revising or amending their basin plans.

Issues

- What are the quantities, types, and sources (point and non-point) of pollutants in the Bay-Delta Estuary?
- What were the quantities and types of pollutants in the Bay-Delta Estuary prior to the observed decline of the striped bass?
- What are the principal persistent pollutants in the Bay-Delta Estuary?
- What are the known links between pollutant loading and concentrations in the Bay-Delta Estuary and detrimental biological effects?
- To what extent do pollutants currently affect species that are being reviewed by the Board for establishment of reasonable levels of protection? Such species include striped bass, chinook salmon, American shad, English sole, Bay shrimp, and Neomysis.
- What is known about the environmental fate of pollutants; i.e., their distribution in the water column, sediment and biota (both toxicity and bioaccumulation)?
- What pollutant loads can the Bay-Delta Estuary assimilate without causing unreasonable impacts on the aquatic ecosystems? How do freshwater inflows affect the Bay's assimilative capacity?
- What deficiencies currently exist in the data base that may prohibit a complete evaluation of the effects of pollutants on the distribution and abundance of Bay-Delta biota?
- What additional actions should the State and Regional Boards 2 and 5 consider to reasonably protect the Bay-Delta's beneficial uses from the effects of pollutants?

TOPIC

7. Program of Implementation

Evidence will be received on the implementation measures the Board should consider to achieve a chosen set of flow and salinity objectives for maintaining Bay-Delta beneficial uses. Evidence will also be received on the implementation measures the Regional Boards and other entities should consider to reasonably protect the Bay-Delta Estuary's beneficial uses from pollutants other than salinity.

The program of implementation may identify public trust values that other governmental agencies are responsible for maintaining. Where appropriate, the State Board expects responsible agencies to fulfull their obligations for the maintenance of such values.

Issues

- What types of implementation measures should be included in the salinity control plan for the Bay-Delta Estuary to achieve a chosen set of flow and salinity objectives?

- What implementation measures should Regional Water Quality Control Boards 2 and 5 consider to achieve a chosen set of objectives that reasonably protects the beneficial uses of the Bay-Delta Estuary from pollutants?

3.2 PHASE II: TOPICS AND ISSUES--REVIEW OF THE DRAFT POLLUTANT POLICY DOCUMENT AND DRAFT WATER QUALITY CONTROL PLAN FOR SALINITY IN THE BAY-DELTA ESTUARY

TOPIC

1. Draft Pollutant Policy Document For the Bay-Delta Estuary

Prior to the start of the second phase of the Bay-Delta hearing, a draft pollutant policy document will have been developed and circulated to participating parties. This document when finalized will serve two purposes. It will:

a. Set State policy on regulation of pollutants in the Bay-Delta Estuary.

b. It will be used by the San Francisco Bay Basin and Central Valley Basin Boards in the update of their basin plans.

During the second phase of the hearing, State Board and Regional Board members will wish to receive comments on the adequacy of the draft pollutant policy document prior to its finalization.

Issues

- Is the draft pollutant policy document adequate? Does the document provide adequate guidance to the Regional Boards to assure uniformity of water quality objectives and to provide reasonable protection of beneficial uses in the Bay-Delta Estuary from pollutants? If not, how should the document be changed?

TOPIC

2. Draft Water Quality Control Plan for Salinity in the Bay-Delta Estuary

Prior to the start of the second phase of the Bay-Delta hearing, a draft salinity control plan will have been developed and circulated to participating parties. The plan will contain three major elements. They are:

a. Identification of the beneficial uses of the Bay-Delta Estuarine system.

b. Flow and salinity objectives for reasonable levels of protection of those beneficial uses.

c. A program of implementation for achieving those objectives.

During the second phase of the hearing evidence will be received by the State Board on the adequacy of the draft plan prior to its finalization.

Issues

- Is the draft salinity control plan adequate? Will the draft salinity control plan provide reasonable protection for the beneficial uses of the Bay-Delta Estuarine system? If not, how should the Plan be changed?

3.3 PHASE III: TOPICS AND ISSUES--CONSIDERATION OF THE IMPACTS OF THE ATTAINMENT ALTERNATIVES AND RECEIPT OF OTHER INFORMATION NEEDED FOR A WATER RIGHT DECISION

TOPIC

1. Impacts of Attainment Alternatives

Prior to the start of the third phase of the Bay-Delta hearing and after adoption of a salinity control plan for the Bay-Delta, a document titled "Water Right Attainment Alternatives" will be developed and circulated to participating parties for review. The subject of the document will be the alternatives for implementing objectives in the salinity control plan through amendment of water right permits and licenses. Pre-1914 and riparian water rights are expected to be considered.

Participating parties will be asked to review this document and present evidence to the Board during the third phase of the hearing on the impacts that may be caused by implementation of the various alternatives identified in the document.

Issues

- What are the social, economic, environmental or other impacts that water users in the hydrologic basin of the Bay-Delta Estuary and in the regions of Water Quality Control Boards for Regions 2, 3, 4, 5, 6, 7, 8, and 9 may experience as a result of implementation of the salinity control plan, insofar as it can be implemented through reasonable control of flows of water through the water right process?

- What are the economic, environmental or other impacts that could occur within the Estuary under the various attainment alternatives.

- How is water used outside the Estuary for beneficial purposes?

- How will implementation of the water quality objectives for the Estuary affect the water quality objectives of Regions 2, 3, 4, 5, 6, 7, 8, and 9?

TOPIC

2. Other Information Needed for a Water Right Decision

Other information may be needed for the Board to complete a water right decision. This topic will not be fully defined until all information needs are known. Currently, the Board expects to need information on the following: (1) the number of water right holders within the hydrologic basin of the Bay-Delta system; (2) the amounts and uses of water under right; (3) certain petitions of the U.S. Bureau of Reclamation to add a point of diversion in the Delta; and (4) certain operational information of the State Water Project and Central Valley Project. Issues related to this topic are as follows:

Issues

- To what extent should the Board take measures to implement regional basin plan amendments?

- What is the tabulation of diverters within the hydrologic basin of the Bay-Delta under the jurisdiction of the Board? (Tabulation includes number of diverters, amounts and seasons of water diverted, and use of the water).

- What terms and conditions should be placed on water right permits and licenses for protection of the Southern Delta beneficial uses.

- What are the operational problems that have been experienced in complying with the standards contained in Water Right Decision 1485?

- Should the petition of the USBR to add the SWP Banks pumping plant as a point of diversion and rediversion and increase the rate of diversion from the Delta be approved?

4.0 PROCEDURES FOR THE BAY-DELTA HEARING

The 1986 Bay-Delta hearing will be conducted in three phases. Phases I and III will be conducted under the procedures for an adjudicative water right hearing. Phase II of the hearing will be conducted as a quasi-legislative hearing to receive comments on a draft pollutant policy document and a draft salinity control plan. After Phase I, the hearing will be continued and the record will remain open between Phase I and Phase III for purposes of a water right decision.

For a detailed description of the Board's adjudicative water right hearing procedures please refer to a Board document titled "The Nuts and Bolts of Water Right Hearings--Process and Procedures", January 1985. This document can be obtained by contacting the Division of Water Rights at (916) 322-4503.

4.1 TESTIMONY

Surprise testimony has no place in this hearing. To that end, advance identification of witnesses intending to testify in Phases I and III of the hearing is required. Parties wishing to offer testimony in the hearing will be asked to estimate the amount of time they require for presentation of testimony on each topic area upon which they wish to present evidence during Phase I. The Board will compile the names and addresses of all the qualified parties to this proceeding. Addition of witnesses during the course of the hearing must be justified and is at the discretion of the hearing officer.

Due to the number of witnesses expected to appear during Phases I and III, and also due to the amount of technical testimony expected in these phases, witnesses will be required to submit a substantial number of copies of a summary in outline form of their testimony sixty days in advance of the date the testimony is scheduled to be presented. Acceptance of testimony outside the scope of the written summary must be justified and will be at the discretion of the hearing officer.

The dates for hearing testimony on each topic will be scheduled in advance, together with the order of presentation of witnesses and the time estimated for each witness.

4.2 EXHIBITS

Introduction of surprise exhibits has no place in this hearing (Phases I and III). Exhibits that will be used to support or illustrate a point will be required to be submitted in advance to the Board. An exhibit being offered in evidence should be substantiated by testimony unless it is a well-known, recognized, and reliable publication of a governmental agency or is stipulated to by all parties. Generally the Board will exclude exhibits which rely on data or technical documents that are not publicly available or accessible unless the data or documents are made public and admitted as exhibits. All parties that intend to use data not presently publicly available must take steps to make the data accessible to the public.

Each party offering exhibits in Phase I or Phase III shall submit to the Board a substantial number of copies of the exhibits and an index of the exhibits sixty days in advance of the first date when the exhibit may be used or referenced during the hearing. The source of the exhibit and cost of reproduction should be identified for each lodged exhibit. This will enable interested parties to order their own copy if desired. Originators of exhibits must furnish a copy of the exhibit within ten days of receipt of a request. The Board will also lodge copies of the exhibits and indexes in places in addition to Sacramento. For those parties not conveniently located to a lodging location, the Board will maintain a limited number of copies for lending. Mailing costs for the loaned exhibits will be borne by those requesting them. Remaining copies of exhibits will be for the use of the Board and its staff.

Each party offering exhibits in Phase I and Phase III will mail the index of their exhibits to each of the qualified parties. Persons wishing to have their own copies of exhibits may make arrangements with the producers of the exhibits. A producer of an exhibit must make the exhibit available at the cost of copying if requested.

Exhibits for Phase II of the hearing shall be submitted on the date of the hearing or within any comment period thereafter.

4.3 CONDUCT OF THE HEARING

Phases I and III of the hearing will be conducted in accordance with the Board's rules and regulations for water right hearings. Elements of Phases I and III of the hearing will include opening statements, direct testimony, cross-examination, redirect and recross examination if necessary, rebuttal and closing arguments or briefs.

Phase II of the hearing will be conducted as a quasi-legislative hearing on the draft salinity control plan and pollutant policy document. Relevant evidence will be received. Participants will not be sworn. There will be no right to cross-examine witnesses.

At specific predetermined times throughout the hearing, persons who wish to make nonevidentiary policy or position statements will be allowed to do so without being sworn and cross-examined. Policy statements will be used in the same manner as opening or closing statements or arguments. It should be clearly understood they do not constitute evidence. Policy statements include the policy views and position of the speaker, non-expert analysis of previously presented evidence, and argument concerning the contents of environmental documents.

5.0 EX PARTE COMMUNICATIONS

When appropriate during the hearing process, parties and interested persons shall avoid ex parte communications with members of the Board regarding the hearing issues. In its usual sense, ex parte means that one party is heard by the Board or a Board member on an issue that will be decided as a result of the hearing in the absence of other parties and without notice to them.

6.0 PARTIES

The Board will consider admitting new parties to the hearing at any stage. Generally, a new party will not be allowed to present evidence on a topic that already has been completed or cross-examine on topics for which cross-examination has been concluded except in extraordinary circumstances. Parties will include the following:

1. Water right holders in the Bay-Delta hydrologic basin; and

2. Interested parties.

7.0 CONTACT PERSONS FOR THE BAY-DELTA HEARING PROCESS

The following State Board personnel have been assigned to develop and coordinate the Bay-Delta hearing activities. You are encouraged to call these individuals for any questions you might have concerning the hearing process.

HEARING MANAGEMENT ACTIVITIES

David Beringer
Program Manager
Bay-Delta Program
(916) 322-9870

LEGAL ACTIVITIES

Barbara Leidigh
Senior Staff Counsel
(916) 324-5757

COORDINATION AND DEVELOPMENT ACTIVITIES

Leo Winternitz
Senior Environmental Specialist
(916) 324-5751

TABLE I

TOPICS FOR THE BAY-DELTA HEARING

PHASE I

1. Hydrologic Conditions

2. Uses Within the Bay-Delta Estuary

   A. Agricultural
   B. Municipal and Industrial
   C. Wildlife
   D. Striped Bass Fishery
   E. Chinook Salmon Fishery
   F. Other Migrating and Resident Fish

3. Uses Within Export Areas

   A. Agricultural
   B. Municipal and Industrial
   C. Other Uses

4. Uses Upstream of the Bay-Delta Estuary

   A. Agricultural
   B. Municipal and Industrial
   C. Other Uses

5. Impacts of Freshwater Inflow on San Francisco Bay

6. Pollutants in the Bay-Delta Estuary

7. Program of Implementation

PHASE II

1. Pollutant Policy Document

2. Draft Water Quality Control Plan for Salinity in the Bay-Delta Estuary

PHASE III.

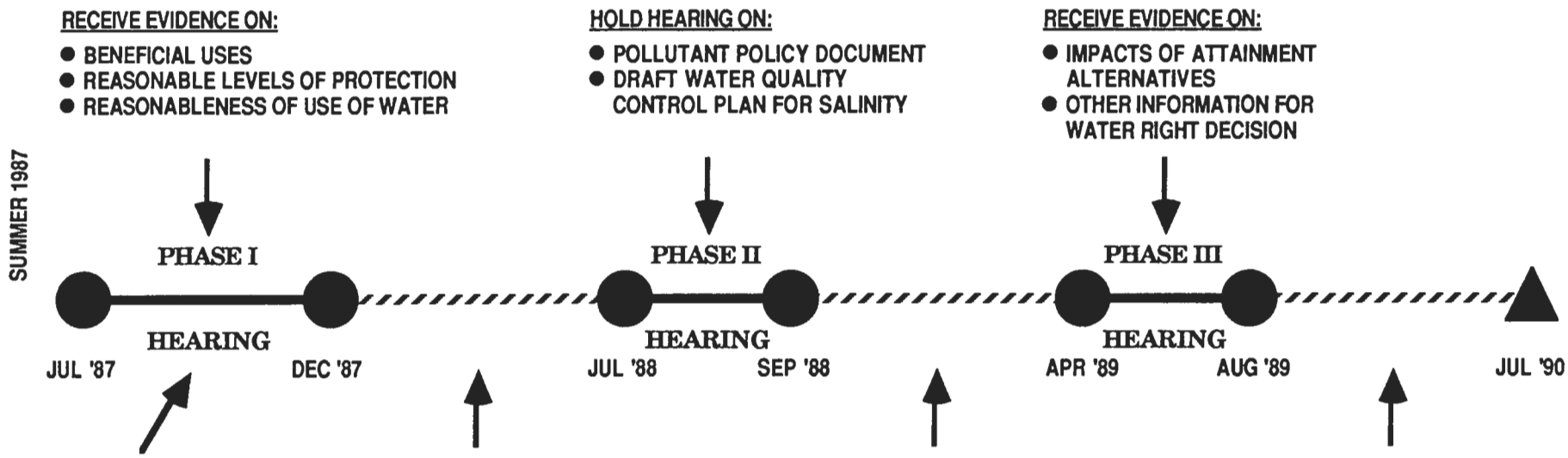
1. Impacts of Attainment Alternatives

2. Other Information Needed for a Water Right Decision

PLATE 1

SCHEDULE FOR THE BAY-DELTA HEARING PROCESS

REVISED JANUARY 19, 1987



RECEIVE EVIDENCE ON:

- BENEFICIAL USES
- REASONABLE LEVELS OF PROTECTION
- REASONABLENESS OF USE OF WATER

HOLD HEARING ON:

- POLLUTANT POLICY DOCUMENT
- DRAFT WATER QUALITY CONTROL PLAN FOR SALINITY

RECEIVE EVIDENCE ON:

- IMPACTS OF ATTAINMENT ALTERNATIVES
- OTHER INFORMATION FOR WATER RIGHT DECISION

ASSISTANCE BY REGIONAL WATER QUALITY CONTROL BOARDS 2 AND 5 (SAN FRANCISCO BAY AND CENTRAL VALLEY) (SEE PLATE 2)

DEVELOP AND CIRCULATE:

- DRAFT WATER QUALITY CONTROL PLAN FOR SALINITY
  - *IDENTIFIES BENEFICIAL USES*
  - *SET OBJECTIVES FOR REASONABLE LEVELS OF PROTECTION OF BENEFICIAL USES*
  - *SETS FORTH PROGRAM OF IMPLEMENTATION*
- POLLUTANT POLICY DOCUMENT
  - *SETS STATE POLICY ON REGULATION OF POLLUTANTS IN THE BAY/DELTA ESTUARY*
  - *WILL BE USED BY REGIONAL BOARDS 2 AND 5 IN THE UPDATE OF THEIR BASIN PLANS*

ADOPT:

- WATER QUALITY CONTROL PLAN FOR SALINITY
- POLLUTANT POLICY DOCUMENT

DEVELOP AND CIRCULATE:

- WATER RIGHT ATTAINMENT ALTERNATIVES
  - *ALTERNATIVES FOR ENFORCING OBJECTIVES IN THE SALINITY CONTROL PLAN THROUGH AMENDMENT OF WATER RIGHT PERMITS AND LICENSES*
  - *ADDRESSES THE SALINITY CONTROL PLAN'S PROGRAM OF IMPLEMENTATION ELEMENTS RELATING TO WATER RIGHTS*

DEVELOP AND CIRCULATE:

- DRAFT ENVIRONMENTAL IMPACT REPORT

COMPILE:

- FINAL ENVIRONMENTAL IMPACT REPORT

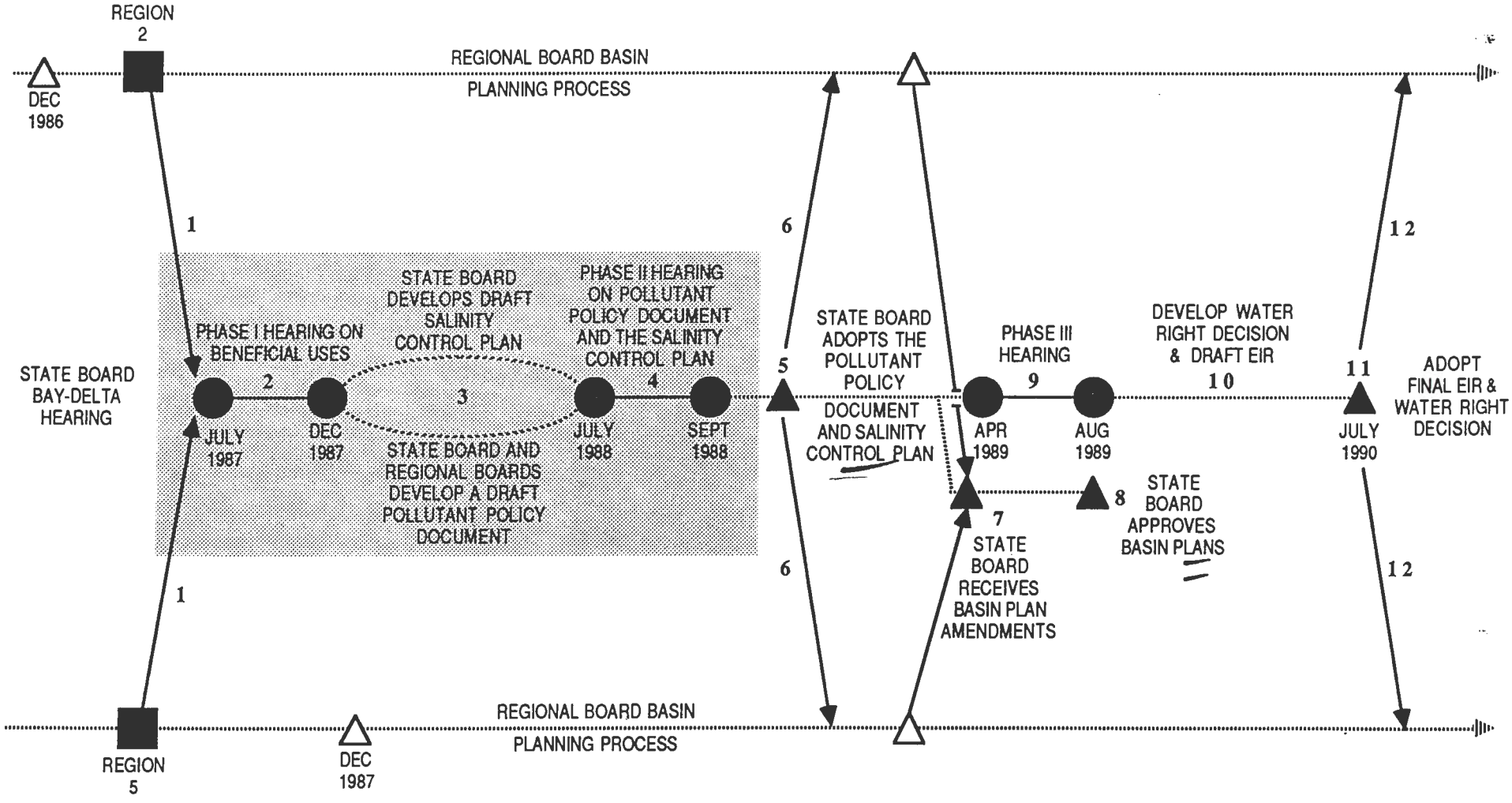
ADOPT:

- FINAL ENVIRONMENTAL IMPACT REPORT
- WATER RIGHT DECISION

PLATE 2

SCHEMATIC OF THE STATE BOARD BAY-DELTA HEARING PROCESS AND REGIONAL BOARD INVOLVEMENT

(REVISED JANUARY 19, 1987)



LEGEND

- STATE BOARD ACTION
- COMPLETION OF TRIENNIAL REVIEW OR BASIN PLAN UPDATE PROCEDURE
- EXTENT OF REGIONAL BOARD AND STAFF PHYSICAL PARTICIPATION

SEE ATTACHED PAGE FOR DESCRIPTION OF ACTIVITIES 1 TO 12

STATE AND REGIONAL BOARD ACTIVITIES
IN THE BAY-DELTA HEARING PROCESS
(The following descriptions correspond
to the numbers in the schematic)

1. Regional Water Quality Control Boards, Regions 2 & 5 participate in the State Board Bay-Delta hearing process.

2. Phase I Hearing--State & Regional Boards receive evidence on:

   - Beneficial uses of the Bay-Delta Waters
   - Reasonable levels of protection
   - Reasonableness of use of water

3. Based on the evidence received:

   - State Board staff, under the guidance of State Board members, will develop and circulate for review a draft Pollutant Policy Document. This document will be developed in consultation with Regional Board representatives.
   - State Board staff, under guidance of State Board members, will develop and circulate for review a draft Water Quality Control Plan for Salinity (Salinity Control Plan).

4. Phase II Hearing

   - State Board conducts a hearing to receive public comments on the draft Pollutant Policy Document and then on the draft Salinity Control Plan. The Regional Boards will be asked to participate in the first part of Phase II when the draft Pollutant Policy Document is discussed.

5. Adoption of Pollutant Policy Document and Bay-Delta Water Quality Control Plan for Salinity

   - The State Board adopts the Pollutant Policy Document and forwards it to the Regional Boards for use in reviewing and updating their Basin Plans.
   - The State Board adopts the Water Quality Control Plan for Salinity. Subsequently the State Board compiles and circulates for review a document titled Water Right Attainment Alternatives.

6. In compliance with the State Board Pollutant Policy Document, Regional Boards review and update their Basin Plans.

7. Regional Boards submit their updated Basin Plans to the State Board for review and approval prior to start of the Phase III hearing.

8. The State Board will review the Basin Plan amendments adopted by the Regional Boards prior to close of Phase III hearing record. Once the State Board approves these plans, they will transmit the Regional Board Basin Plans and the Bay-Delta Salinity Control Plan to the Environmental Protection Agency for consideration. The Basin Plans will then be introduced into evidence as part of the Phase III hearing record.

9. Phase III Hearing--State Board receives evidence on:

   - Impacts of the Water Right Attainment Alternatives.
   - Other information needed for a Water Right Decision.

10. Based on evidence received, the State Board will:

    - Develop and circulate a draft Environmental Impact Report.
    - Develop a draft Water Right Decision.
    - Compile a final Environmental Impact Report

11. The State Board adopts a Final Environmental Impact Report then a Water Right Decision.

12. Based on the allocation of flows in the water right decision, Regional Boards continue the ongoing basin planning process in accordance with routine review procedures.

United States
Environmental Protection
Agency

Regional Administrator
215 Fremont Street
San Francisco CA 94105

Region 9
Arizona, California
Hawaii, Nevada
Pacific Islands

EPA

23 FEB 1990

Mr. W. Don Maughan
Chairman
State Water Resources Control Board
State of California
P.O. Box 100
Sacramento, CA 95801

Dear Mr. Maughan:

Thank you for the opportunity to comment on the draft chapters of the Water Quality Control Plan for the Bay/Delta Estuary. I commend the Board for seeking to obtain the latest available information before preparing a Draft Plan.

In our May 25, 1989 comments on the Draft Revised Workplan for the Proceedings, EPA emphasized that the Water Quality Control Plan should contain standards sufficient to protect the designated uses of the estuary. After reviewing the standards proposed for consideration, I remain concerned that the Plan does not fully satisfy the requirements of the Clean Water Act and EPA regulations.

Before discussing these concerns, I will review EPA's statutory obligations under the Clean Water Act, and our previous actions with respect to the 1978 Delta Plan.

I. Requirements of the Clean Water Act and EPA Regulations

A. Adoption of Standards

The Clean Water Act Amendments of 1972 required each State to adopt "water quality standards," which consist of two components:

(1) "designated uses" for a waterbody. These uses are analogous to the "beneficial uses" established by the State and Regional Boards.

(2) "water quality criteria" which protect the most sensitive of the designated uses. These criteria are analogous to the Delta Plan's "objectives."

A State's standards must provide water quality for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water, and must comply with the Act's primary goal of restoring and maintaining the "chemical, physical, and biological integrity of the Nation's waters."

In addition, States must establish an "antidegradation" policy designed to maintain and protect existing uses and water quality, to provide protection for higher quality waters, and to protect outstanding natural resource waters. Existing uses are defined as those uses that were attained in the waterbody on or after November 28, 1975. The antidegradation policy applies to any action that may lower water quality or adversely affect existing uses.

Finally, the Clean Water Act requires each State to review and, if necessary, revise its water quality standards at least once every three years (a "Triennial Review"). Any changes in water quality standards adopted by the State in connection with its Triennial Review must be submitted to EPA for review and approval.

B. **EPA Review of Water Quality Standards**

After a State submits its new or revised standards, EPA must either formally approve the revisions within 60 days of their submission or formally disapprove the revisions within 90 days of their submission. In order to approve a new or revised standard, EPA must find that the State's water quality criteria are sufficient to protect the State's designated uses. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the most sensitive designated uses.

EPA must disapprove the State's standards if they are not consistent with EPA regulations. If the State does not make the necessary changes within 90 days, EPA must promptly initiate promulgation of a Federal standard that will supersede the submitted State standard.

II. Previous EPA Involvement in Delta Water Quality Planning

In 1978, the Board adopted and submitted to EPA a Water Quality Control Plan (the Delta Plan) containing a comprehensive set of water quality standards to protect the designated beneficial uses of the Sacramento-San Joaquin Delta. The Delta Plan established water quality standards for three categories of beneficial uses: municipal and industrial, agriculture, and fish and wildlife.

A key set of standards to protect fish and wildlife uses were the striped bass spawning and survival standards, which were established to provide minimum salinity and flow conditions to protect the fishery at levels that would have existed in the absence of the State and Federal Water Projects. The striped bass survival standard was based on a statistical correlation between Delta outflow, Delta diversions, and the Striped Bass Index (SBI), a measure of abundance levels of young striped bass. The Plan emphasized striped bass protection because of its commercial importance and the relative abundance of information on the fishery, but also indicated that it considered the striped bass standards to be a surrogate for protection of other species.

EPA approved the Delta Plan in 1980. At that time, however, EPA was concerned that the Delta Plan standards would not provide adequate protection of striped bass and the estuary's fishery resources. EPA therefore conditioned its approval upon a set of "interpretations" of the standards, including commitments by the State to immediately review and revise the Delta Plan standards if there were measurable adverse impacts on spawning, or if necessary to attain "without project" levels of protection. The State Board concurred with these interpretations in its letter dated November 21, 1980.

In the years since the Delta Plan was adopted, these standards have not accomplished the intended goal of maintaining the Striped Bass Index at a long term average of 79, the Plan's estimate of "without project" levels. During this period, the actual Striped Bass Index averaged about 22, and in 1988 and 1989 reached all-time lows of 4.6 and 5.1.

EPA has expressed its concern to the Board about the need for the standards to adequately protect the fishery resources. Throughout the State's first and second triennial reviews ending in 1981 and 1985, EPA urged the Board to review and revise the Delta Plan in accordance with EPA's 1980 approval letter. At the conclusion of each triennial review, however, the Board made no changes.

Following the State's second triennial review, when the State resubmitted its water quality standards, EPA on June 29, 1987 sent a letter to the Board stating that EPA could no longer approve the striped bass survival standards or the relaxation provision of the spawning standard because these standards did not adequately protect the designated beneficial uses. EPA recognized, however, that the State Board had initiated new hearings to revise the Delta Plan standards. In a letter to EPA on June 23, 1986, the Board had acknowledged that the current standards are not adequate to protect the fisheries, but proposed a coordinated effort by the State and Regional Boards to assure that water quality standards would be established to fully protect the designated beneficial uses. EPA therefore indicated in its June 29, 1987 letter that it would approve or disapprove the revised standards following the hearing process and the State's submission of a complete set of revised standards to EPA.

Following the first phase of the hearings, the Board in November 1988 issued a draft Plan that included revised salinity and flow standards to protect the fisheries and other uses. The Board subsequently withdrew that draft Plan, however, and issued the revised workplan that serves as the basis for the Board's current proceedings.

III. EPA's Present Concerns

As suggested above in my summary of EPA's legal obligations, our concerns over the direction of the present proceedings and triennial review involve both the content of the Plan and the timing of the Board's process.

As to content, EPA has expressed concern that the existing Delta Plan standards have failed to adequately protect the Delta's fishery resources. Our continuing concern is that new or revised standards have not been established and submitted to EPA that satisfy the

outstanding conditions of EPA's approval of the 1978 Plan, and that protect the designated beneficial uses of the estuary. As our June 29, 1987 letter indicated, EPA was relying on the present proceedings to satisfy these requirements. The Workplan and draft chapters, however, state that the scope of this Water Quality Control Plan will be limited to addressing the direct effects of salinity and temperature on certain species. Additional measures that may be necessary to restore and maintain "estuarine habitat" and other uses designated for protection in the State's water quality standards will be addressed in subsequent phases of the proceedings. EPA will not be able to consider approval of the State's water quality standards until a comprehensive set of standards is submitted in this and in subsequent phases of the proceedings.

In addition, as explained in full in our May 25, 1989 comments on the Workplan, we are concerned about the scientific basis of the standards that are included in the revised Plan. In many instances, it is unclear whether the differences within the sets of alternative standards proposed for consideration arise from conflicting scientific evidence or from the potential economic impacts of meeting a fully protective alternative. As noted above, to satisfy Clean Water Act requirements, water quality standards must be sufficient to fully protect existing and designated uses and must be based on an acceptable scientific evaluation. The draft Plan should clearly specify the scientific rationale for each preferred alternative.

As to the timing of the process, EPA and the State are both operating under a Congressional mandate to perform a triennial review of the standards. The Clean Water Act places primary responsibility on the State to develop and revise water quality standards, and for that reason EPA has deferred to the State's ongoing planning process as the most expeditious way to deal with our concerns. Nevertheless, the Act does not envision an open-ended process; at some point EPA must take a more active role to ensure adoption of water quality standards pursuant to the statutory mandate and time schedules set forth in the Act.

In closing, I am pleased that the Board has made a commitment to protect the designated uses of the estuary in accordance with the Clean Water Act, and I hope these comments have clarified EPA's concerns. Should you have any further questions, please contact me, or have your staff contact Patrick Wright at 415/705-2181. We look forward to working with you and the Board as you complete the present triennial review.

Sincerely,

Daniel W. McGovern
Regional Administrator

Enclosures

Enclosure 1

ENVIRONMENTAL PROTECTION AGENCY
July 1980

EPA INTERPRETATIONS OF WATER QUALITY STANDARDS
SACRAMENTO-SAN JOAQUIN DELTA and SUISUN MARSH
(DELTA PLAN)

1. If two numerical values in the water quality standards conflict, the more stringent value will prevail.

2. If it is shown that there is a measurable adverse effect on striped bass spawning*, then a complete review of the Striped Bass Spawning Standard Relaxation Provision (at the Antioch Waterworks Intake when project deficiencies are imposed) (Table VI-1, page VI-31) shall commence immediately. Similarly, if any change in Suisun Marsh Chipps Island standards is proposed, as part of that standards amendment process, a review and revision of the Relaxation Provision shall commence.

3. If there is a measurable decrease** in the Striped Bass Index (SBI) below that predicted, the SWRCB shall commence immediate actions to review and revise the Delta Plan standards such that "without project" levels of protection are attained. It is our understanding that an average SBI of 79 represents "without project" protection.

---

* "A measurable adverse effect on striped bass spawning" means the following: the Striped Bass Index (SBI) for the individual year is decreased by more than 3 standard deviations from that which would otherwise be predicted using the relationships shown on Figures III-27 and III-28 of the Final EIR for Delta Plan adopted August, 1978.

** Measurable decrease means either:

(1) three consecutive years where the SBI is decreased by more than one standard deviation below that which would otherwise be predicted for each year using the relationships shown in Figures 111-27 and 111-28 of the Final EIR of the Delta Plan adopted August, 1978; or

(2) six consecutive years where the SBI is below that predicted for each year, using the above relationships.

Enclosure 2

ENVIRONMENTAL PROTECTION AGENCY
July 1980

ADDITIONAL WATER QUALITY STANDARDS DEVELOPMENT
SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH
(DELTA PLAN)

As a part of the water quality standards revision process pursuant to section 35.1550, the State shall develop additional water quality standards specified below and shall hold public hearings and shall adopt revisions to water quality standards as appropriate.

1. Through State Water Resources Control Board Resolution No. 80-18, "Adoption of a Schedule of Hearings and Actions to Resolve Outstanding Issues Related to the Bay-Delta Watershed," adopted by the Board on April 17, 1980, the Board has committed itself to review water quality issues, to develop additional water quality standards, and to adopt the developed standards. The following list of standards needs is included in work covered by Resolution No. 80-18 and shall be completed as scheduled in the Resolution:

   a. In its review of standards, the Board shall evaluate information developed on:

      1) water treatment costs for industrial processes and municipal uses;

      2) reclamation potential of wastewater;

      3) potential for crop decrement to salt sensitive tree crops and sprinkler irrigated ornamental shrubs for municipal and industrial users from the western delta; and

      4) shall develop additional standards as appropriate to protect those uses.

   b. The State has studies underway to determine the water quality needed to protect agriculture during the portion of the year between August 16 and March 30. These studies are scheduled to be completed by 1982. Additional standards to protect this beneficial use shall be developed.

   c. The State shall evaluate the ongoing negotiations between the State Department of Water Resources, Water and Power Resources Service (formerly USBR) and the South Delta Water

Agency to resolve differences in the determination of effective and acceptable means to protect southern delta agricultural use and develop additional standards to protect this beneficial use, as appropriate.

d. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from striped bass survival standards and provide more appropriate protection for other fish species and aquatic life.

e. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from Suisun Marsh standards and provide more direct protection for aquatic life in marsh channels and open waters.

f. The State has studies underway to determine the water quality needed to protect beneficial uses of San Francisco Bay. These studies are scheduled to be used in a State Board standards review in 1986. The State shall develop standards based on any early conclusions of these studies as soon as possible. These will include standards that maintain the natural periodic overturn in the South Bay to protect the designated beneficial uses of those waters. In any case extensive review of Bay salinity standards shall commence no later than 1986.

g. The State has studies underway to determine the effects of algal productivity in the estuary (including biostimulation) on water quality. These studies shall be used to develop standards to control excessive biostimulation in the estuary as soon as possible. Continued studies and modeling efforts to refine these standards shall be used to update these standards.

2. As part of the triennial review to be submitted to the State Board by August 1981, the State shall evaluate the following to determine what new or additional standards and/or plans of implementation shall be adopted to protect designated beneficial uses.

a) the water quality standards in Cache Slough at the City of Vallejo intake to restore and/or correct any deficiencies in protection of designated beneficial uses that may exist there.

b) water quality standards to protect drinking water supplies from precursors of trihalomethanes. (e.g., salinity and organic materials).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

Carla M. Bard, Chairwoman
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

28 AUG 1980

Dear Ms. Bard:

We have reviewed California's water quality standards for the Sacramento-San Joaquin Delta and Suisun Marsh as contained in the Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh (Delta Plan) adopted by the State Water Resources Control Board on August 16, 1978, by means of Resolution No. 78-43. Also, we have reviewed various supporting materials including the January 25, 1979 transmittal of the Delta Plan and the February 7, 1980 transmittal of additional information to supplement the Board's 1979 transmittal.

I am pleased to inform you that I am approving California's Delta Plan as standards for these waters pursuant to Section 303(c) of the Clean Water Act. This action is based upon my determination that these water quality standards are consistent with the protection of the public health and welfare and the purposes of the Clean Water Act.

I commend the State Water Resources Control Board for its cooperation in working with the Environmental Protection Agency in developing and adopting these revised standards. With this approval, the current Federally approved water quality standards for the San Francisco Bay Basin (2) and the Sacramento-San Joaquin Delta Basin (5B) are, in addition to the Delta Plan, the following State Water Resources Control Board documents:

Sacramento-San Joaquin Delta Basin (5B)

"Water Quality Control Plan Report, Sacramento River Basin (5A), Sacramento-San Joaquin Delta Basin (5B), San Joaquin Basin (5C), Volume I", August 21, 1975, as amended, Chapters 2 and 4 ("Basin 5B Plan")

"Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California", May 18, 1972, as amended

State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California", October 1968

"Water Quality Control Policy for the Enclosed Bays and Estuaries of California," May 1974

San Francisco Bay Basin (2)

These State Water Resources Control Board documents also apply in the San Francisco Bay Basin with the exception that the "Basin 5B Plan" should be replaced by the following documents:

"Water Quality Control Plan, San Francisco Bay Basin (2), Part I", April 17, 1975, as amended, Chapters 2 and 4 ("Basin 2 Plan")

"Water Quality Control Plan for Ocean Waters of California", January 19, 1978, as amended (Ocean Plan)

The Delta Plan supersedes Figure 4-1 and the Delta salinity standards of Table 4-2, both contained in the Basin 5B Plan. Also, the Delta Plan supersedes the Chipps Island and Suisun Marsh salinity standards of the Basin 2 Plan.

In approving the Delta Plan water quality standards, it is my assumption that the interpretations stated in Enclosure 1 and the schedules for additional standards development set forth in Enclosure 2 will be followed by the Board in the development and refinement of Delta standards. To assure that no misunderstanding may occur, please confirm to me within a month of the date of this letter that these interpretations and schedules conform with the State's views. These interpretations and schedules are not intended to alter any of the conditions, interpretations or schedules of water quality standards development that are outstanding from the letters of approval for any of the previously approved standards in other policies and plans that apply to these waters.

In these continuing efforts toward developing water quality standards, it will be our pleasure to continue to work together with the State to protect the quality of California's waters.

Sincerely yours,

Paul De Falco, Jr.
Regional Administrator

Enclosures

STATE OF CALIFORNIA—[illegible] AGENCY
STATE WATER RESOURCES CONTROL BOARD
P.O. BOX 100, SACRAMENTO, CALIFORNIA 95801
(916) 322-9870

EDMUND G. BROWN JR., *Governor*

PEI 12

NOV 21 1980

Ms. Sheila M. Prindiville
Acting Regional Administrator
U. S. Environmental Protection
Agency, Region IX
215 Fremont Street
San Francisco, CA 94105

Dear ~~Ms. Prindiville~~:

1978 DELTA PLAN

I was most pleased to receive your August 28 letter approving the water quality standards established by the Board's Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh. I am extremely happy EPA agrees that the water quality standards adopted by the Board for the protection of beneficial uses in the Delta and Suisun Marsh meet the stringent requirements for environmental protection established under Federal law.

You asked for Board concurrence with the interpretations and schedules set forth in Enclosures 1 and 2 of your letter. The Board has reviewed these enclosures and concurs with them. The Board has already directed staff to develop standards in the areas of concern to EPA. The schedules established by the Board in Resolution 80-18 to address important Bay-Delta issues will be modified to allow for these additional areas of study. Revision and adoption of appropriate standards will follow the process established by both State and Federal law.

Thank you for your continued cooperation in helping us solve the complex issues facing the State.

Sincerely,

Carla M. Bard
Chairwoman

United States
Environmental Protection
Agency

Regional Administrator
215 Fremont Street
San Francisco CA 94105

Region 9
Arizona, California
Hawaii, Nevada
Pacific Islands

EPA

2 9 JUN 1987

Mr. W. Don Maughan
Chairman
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Dear Mr. Maughan:

The U.S. Environmental Protection Agency (EPA) has reviewed State Board Resolutions 85-4 and 87-7, and other relevant materials concerning the Second Triennial Review of the Water Quality Control Plan for the Sacramento/San Joaquin Delta and Suisun Marsh (Delta Plan).

Delta water quality is presently governed by four sets of standards: the Delta Plan, the Water Quality Control Plans for the Central Valley and the San Francisco Bay Basins (Basin Plans), and the Water Quality Control Policy for the Enclosed Bays and Estuaries of California (Bays and Estuaries Policy). This action concerns only the water quality standards contained in the Delta Plan.

The State Board completed the Delta Plan Second Triennial Review in January of 1985 when it adopted Resolution 85-4, and submitted the results of the review to EPA for approval on June 26, 1985. On September 18, 1985 EPA requested additional information from the Board to support certain findings, and gave the Board the opportunity to either supply this information or to modify the findings made in Resolution 85-4. Since neither the requested information nor these modifictions were forthcoming by the time the Board adopted Resolution 87-7 on February 5, 1987 (adopting the workplan for the upcoming Bay-Delta hearings), EPA is taking the following action.

EPA approves the water quality standards contained in the Delta Plan with the exception of the striped bass survival standards and the relaxation provision of the striped bass spawning standard. EPA can not approve these two standards as we believe the standards do not adequately protect the fishery resource. EPA does, however, recognize

that the necessary changes to these standards are difficult to specify. We also note that the State Board has embarked upon a full-scale review of the Delta Plan standards through a public hearing process. It is mandatory that this process result in standards which provide assured protection for the resource. At the termination of the hearing process, and the submission of the State's standards to EPA, EPA will at that time, take an approve or disapprove action.

In regard to the striped bass survival standards, it is important to note that one of the goals of the Delta Plan was to maintain the fishery in the estuary at levels which would have existed in the absence of the State Water Project and the Federal Central Valley Project. The striped bass was chosen by the State in 1978 as the key indicator species to be used in measuring the health of the fishery resource in the estuary. The striped bass index (SBI), was based upon a relationship between flow and young striped bass survival. This relationship was then translated into enforceable water quality standards for flow through the Delta. In order to restore and maintain the fishery at "without project" levels, these standards were established to attain a long term average SBI of 79. This specific target SBI quantitatively defines the success of the Delta flow standards in protecting the fishery. In adopting the Delta Plan, the Board determined that water quality objectives for flow and salinity alone were sufficient to protect the beneficial uses.

However, the striped bass index as measured between 1978 and 1984 was significantly below the number predicted. The validity of the correlation between flow and striped bass survival has become obscured, perhaps because either: 1) the correlation is no longer as strong as it once appeared, and hence the standard is no longer based upon sound scientific rationale; or 2) some other constituent(s) other than flow and salinity may be severely impacting the striped bass fishery. Regardless of which of these may prove to be the case, the continuing decline of the striped bass index clearly indicates the inadequacy of the existing striped bass survival standards, and the need for substantial revisions in the next Delta Water Quality Control Plan. EPA, therefore, cannot approve these standards.

As mentioned, although the cause behind the continuing decline of the striped bass index may not be clear, it is reasonable to presume that there still exists a flow-survival relationship, and that increased freshwater flows may be necessary in order to better protect the survival of young striped bass. It is EPA's position that the State Board should not allow any further incremental diversions of freshwater flows above those that are presently permitted, until the upcoming Bay-Delta water quality standards review and revision process is completed. Additionally, should the State, as a result of the hearings, decide to allow increased diversions out of the estuary, it may do so only after the necessary antidegradation requirements have been satisfied.

As for the relaxation provision of the striped bass spawning standards, we do not at this time take issue with the scientific validity of the spawning standard itself; however, the evidence for allowing a relaxation of the standard is questionable. Page VI-3 of the Delta Plan states "it may be possible to exceed these values for brief periods with little adverse effect on spawning." Since the drought years of 1976-77 when there was a long period of exceedances of adequate salinity conditions for spawning, the striped bass abundance has not recovered to levels predicted, based upon Delta outflow. While the Delta Plan was not in place at that time, EPA believes that these data have shown that the impacts of the relaxation provision were underestimated. The Board's administrative record (Delta Plan and EIR) supporting the relaxation does not provide any scientific evidence that this relaxation provision will not adversely affect spawning of striped bass. We believe that this evidence is mandatory before EPA can approve such a provision. Therefore, at this time the relaxation provision of the striped bass spawning standard is not approvable.

As we find ourselves in the midst of what will be classified as a "critical" year by the State Department of Water Resources, the issue of the relaxation provision is especially relevant. It is EPA's position that the State Board should remove the relaxation provision until such time as its appropriateness can be demonstrated. This would not preclude the adoption of a similar provision in the Water Quality Control Plan that will result from the Bay-Delta hearings that are scheduled to begin in July.

Regarding the upcoming hearings, additional areas which have been addressed in our earlier letters and which must be addressed in the upcoming hearings include the water quality needs of the Southern Delta and San Francisco Bay. Also, the recently enacted Water Quality Act of 1987 contains some new requirements which will have a direct bearing on the upcoming proceedings. Enclosures 1 and 2 contain a list of both outstanding and new issues that must be considered in the 1987-88 Delta hearings. I would recommend an early meeting between our respective staffs to discuss these issues.

EPA realizes the difficulty of establishing standards for a complex system such as the Bay-Delta estuary. Nonetheless, we have an unswerving commitment to maintain the water quality of the estuary. For this reason we have in the past urged the development of standards to provide interim protection of beneficial uses. This action serves as a recognition that, despite these historic efforts by the State, the San Francisco Bay-Delta is not being adequately protected.

We look forward to working with the State Board towards developing water quality standards for the estuary which will be truly protective of the resource, the importance of which cannot be overstated.

Sincerely,
ORIGINAL SIGNED BY:
JUDITH E. AYRES

JUDITH E. AYRES
Regional Administrator

Enclosures

cc: Executive Officer, Central Valley Regional Water Quality Control Board (w/o enclosures)
Executive Officer, San Francisco Bay Regional Water Quality Control Board (w/o enclosures)

RA - Reading File
W-1 - Reading File
W-3 - Reading File
W-3 - Official File

W-3 - J. Johnstone, Larry, 06/24/87

United States
Environmental Protection
Agency

Regional Administrator
215 Fremont Street
San Francisco CA 94105

Region 9
Arizona, California
Hawaii, Nevada
Pacific Islands

EPA

23 FEB 1990

Mr. W. Don Maughan
Chairman
State Water Resources Control Board
State of California
P.O. Box 100
Sacramento, CA 95801

Dear Mr. Maughan:

Thank you for the opportunity to comment on the draft chapters of the Water Quality Control Plan for the Bay/Delta Estuary. I commend the Board for seeking to obtain the latest available information before preparing a Draft Plan.

In our May 25, 1989 comments on the Draft Revised Workplan for the Proceedings, EPA emphasized that the Water Quality Control Plan should contain standards sufficient to protect the designated uses of the estuary. After reviewing the standards proposed for consideration, I remain concerned that the Plan does not fully satisfy the requirements of the Clean Water Act and EPA regulations.

Before discussing these concerns, I will review EPA's statutory obligations under the Clean Water Act, and our previous actions with respect to the 1978 Delta Plan.

I. Requirements of the Clean Water Act and EPA Regulations

A. Adoption of Standards

The Clean Water Act Amendments of 1972 required each State to adopt "water quality standards," which consist of two components:

(1) "designated uses" for a waterbody. These uses are analogous to the "beneficial uses" established by the State and Regional Boards.

(2) "water quality criteria" which protect the most sensitive of the designated uses. These criteria are analogous to the Delta Plan's "objectives."

A State's standards must provide water quality for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water, and must comply with the Act's primary goal of restoring and maintaining the "chemical, physical, and biological integrity of the Nation's waters."

In addition, States must establish an "antidegradation" policy designed to maintain and protect existing uses and water quality, to provide protection for higher quality waters, and to protect outstanding natural resource waters. Existing uses are defined as those uses that were attained in the waterbody on or after November 28, 1975. The antidegradation policy applies to any action that may lower water quality or adversely affect existing uses.

Finally, the Clean Water Act requires each State to review and, if necessary, revise its water quality standards at least once every three years (a "Triennial Review"). Any changes in water quality standards adopted by the State in connection with its Triennial Review must be submitted to EPA for review and approval.

B. **EPA Review of Water Quality Standards**

After a State submits its new or revised standards, EPA must either formally approve the revisions within 60 days of their submission or formally disapprove the revisions within 90 days of their submission. In order to approve a new or revised standard, EPA must find that the State's water quality criteria are sufficient to protect the State's designated uses. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the most sensitive designated uses.

EPA must disapprove the State's standards if they are not consistent with EPA regulations. If the State does not make the necessary changes within 90 days, EPA must promptly initiate promulgation of a Federal standard that will supersede the submitted State standard.

II. Previous EPA Involvement in Delta Water Quality Planning

In 1978, the Board adopted and submitted to EPA a Water Quality Control Plan (the Delta Plan) containing a comprehensive set of water quality standards to protect the designated beneficial uses of the Sacramento-San Joaquin Delta. The Delta Plan established water quality standards for three categories of beneficial uses: municipal and industrial, agriculture, and fish and wildlife.

A key set of standards to protect fish and wildlife uses were the striped bass spawning and survival standards, which were established to provide minimum salinity and flow conditions to protect the fishery at levels that would have existed in the absence of the State and Federal Water Projects. The striped bass survival standard was based on a statistical correlation between Delta outflow, Delta diversions, and the Striped Bass Index (SBI), a measure of abundance levels of young striped bass. The Plan emphasized striped bass protection because of its commercial importance and the relative abundance of information on the fishery, but also indicated that it considered the striped bass standards to be a surrogate for protection of other species.

EPA approved the Delta Plan in 1980. At that time, however, EPA was concerned that the Delta Plan standards would not provide adequate protection of striped bass and the estuary's fishery resources. EPA therefore conditioned its approval upon a set of "interpretations" of the standards, including commitments by the State to immediately review and revise the Delta Plan standards if there were measurable adverse impacts on spawning, or if necessary to attain "without project" levels of protection. The State Board concurred with these interpretations in its letter dated November 21, 1980.

In the years since the Delta Plan was adopted, these standards have not accomplished the intended goal of maintaining the Striped Bass Index at a long term average of 79, the Plan's estimate of "without project" levels. During this period, the actual Striped Bass Index averaged about 22, and in 1988 and 1989 reached all-time lows of 4.6 and 5.1.

EPA has expressed its concern to the Board about the need for the standards to adequately protect the fishery resources. Throughout the State's first and second triennial reviews ending in 1981 and 1985, EPA urged the Board to review and revise the Delta Plan in accordance with EPA's 1980 approval letter. At the conclusion of each triennial review, however, the Board made no changes.

Following the State's second triennial review, when the State resubmitted its water quality standards, EPA on June 29, 1987 sent a letter to the Board stating that EPA could no longer approve the striped bass survival standards or the relaxation provision of the spawning standard because these standards did not adequately protect the designated beneficial uses. EPA recognized, however, that the State Board had initiated new hearings to revise the Delta Plan standards. In a letter to EPA on June 23, 1986, the Board had acknowledged that the current standards are not adequate to protect the fisheries, but proposed a coordinated effort by the State and Regional Boards to assure that water quality standards would be established to fully protect the designated beneficial uses. EPA therefore indicated in its June 29, 1987 letter that it would approve or disapprove the revised standards following the hearing process and the State's submission of a complete set of revised standards to EPA.

Following the first phase of the hearings, the Board in November 1988 issued a draft Plan that included revised salinity and flow standards to protect the fisheries and other uses. The Board subsequently withdrew that draft Plan, however, and issued the revised workplan that serves as the basis for the Board's current proceedings.

III. EPA's Present Concerns

As suggested above in my summary of EPA's legal obligations, our concerns over the direction of the present proceedings and triennial review involve both the content of the Plan and the timing of the Board's process.

As to content, EPA has expressed concern that the existing Delta Plan standards have failed to adequately protect the Delta's fishery resources. Our continuing concern is that new or revised standards have not been established and submitted to EPA that satisfy the

outstanding conditions of EPA's approval of the 1978 Plan, and that protect the designated beneficial uses of the estuary. As our June 29, 1987 letter indicated, EPA was relying on the present proceedings to satisfy these requirements. The Workplan and draft chapters, however, state that the scope of this Water Quality Control Plan will be limited to addressing the direct effects of salinity and temperature on certain species. Additional measures that may be necessary to restore and maintain "estuarine habitat" and other uses designated for protection in the State's water quality standards will be addressed in subsequent phases of the proceedings. EPA will not be able to consider approval of the State's water quality standards until a comprehensive set of standards is submitted in this and in subsequent phases of the proceedings.

In addition, as explained in full in our May 25, 1989 comments on the Workplan, we are concerned about the scientific basis of the standards that are included in the revised Plan. In many instances, it is unclear whether the differences within the sets of alternative standards proposed for consideration arise from conflicting scientific evidence or from the potential economic impacts of meeting a fully protective alternative. As noted above, to satisfy Clean Water Act requirements, water quality standards must be sufficient to fully protect existing and designated uses and must be based on an acceptable scientific evaluation. The draft Plan should clearly specify the scientific rationale for each preferred alternative.

As to the timing of the process, EPA and the State are both operating under a Congressional mandate to perform a triennial review of the standards. The Clean Water Act places primary responsibility on the State to develop and revise water quality standards, and for that reason EPA has deferred to the State's ongoing planning process as the most expeditious way to deal with our concerns. Nevertheless, the Act does not envision an open-ended process; at some point EPA must take a more active role to ensure adoption of water quality standards pursuant to the statutory mandate and time schedules set forth in the Act.

In closing, I am pleased that the Board has made a commitment to protect the designated uses of the estuary in accordance with the Clean Water Act, and I hope these comments have clarified EPA's concerns. Should you have any further questions, please contact me, or have your staff contact Patrick Wright at 415/705-2181. We look forward to working with you and the Board as you complete the present triennial review.

Sincerely,

Daniel W. McGovern
Regional Administrator

Enclosures

Enclosure 1

ENVIRONMENTAL PROTECTION AGENCY
July 1980

EPA INTERPRETATIONS OF WATER QUALITY STANDARDS
SACRAMENTO-SAN JOAQUIN DELTA and SUISUN MARSH
(DELTA PLAN)

1. If two numerical values in the water quality standards conflict, the more stringent value will prevail.

2. If it is shown that there is a measurable adverse effect on striped bass spawning*, then a complete review of the Striped Bass Spawning Standard Relaxation Provision (at the Antioch Waterworks Intake when project deficiencies are imposed) (Table VI-1, page VI-31) shall commence immediately. Similarly, if any change in Suisun Marsh Chipps Island standards is proposed, as part of that standards amendment process, a review and revision of the Relaxation Provision shall commence.

3. If there is a measurable decrease** in the Striped Bass Index (SBI) below that predicted, the SWRCB shall commence immediate actions to review and revise the Delta Plan standards such that "without project" levels of protection are attained. It is our understanding that an average SBI of 79 represents "without project" protection.

---

* "A measurable adverse effect on striped bass spawning" means the following: the Striped Bass Index (SBI) for the individual year is decreased by more than 3 standard deviations from that which would otherwise be predicted using the relationships shown on Figures III-27 and III-28 of the Final EIR for Delta Plan adopted August, 1978.

** Measurable decrease means either:

(1) three consecutive years where the SBI is decreased by more than one standard deviation below that which would otherwise be predicted for each year using the relationships shown in Figures III-27 and III-28 of the Final EIR of the Delta Plan adopted August, 1978; or

(2) six consecutive years where the SBI is below that predicted for each year, using the above relationships.

Enclosure 2

ENVIRONMENTAL PROTECTION AGENCY
July 1980

ADDITIONAL WATER QUALITY STANDARDS DEVELOPMENT
SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN MARSH
(DELTA PLAN)

As a part of the water quality standards revision process pursuant to section 35.1550, the State shall develop additional water quality standards specified below and shall hold public hearings and shall adopt revisions to water quality standards as appropriate.

1. Through State Water Resources Control Board Resolution No. 80-18, "Adoption of a Schedule of Hearings and Actions to Resolve Outstanding Issues Related to the Bay-Delta Watershed," adopted by the Board on April 17, 1980, the Board has committed itself to review water quality issues, to develop additional water quality standards, and to adopt the developed standards. The following list of standards needs is included in work covered by Resolution No. 80-18 and shall be completed as scheduled in the Resolution:

   a. In its review of standards, the Board shall evaluate information developed on:

      1) water treatment costs for industrial processes and municipal uses;

      2) reclamation potential of wastewater;

      3) potential for crop decrement to salt sensitive tree crops and sprinkler irrigated ornamental shrubs for municipal and industrial users from the western delta; and

      4) shall develop additional standards as appropriate to protect those uses.

   b. The State has studies underway to determine the water quality needed to protect agriculture during the portion of the year between August 16 and March 30. These studies are scheduled to be completed by 1982. Additional standards to protect this beneficial use shall be developed.

   c. The State shall evaluate the ongoing negotiations between the State Department of Water Resources, Water and Power Resources Service (formerly USBR) and the South Delta Water

Agency to resolve differences in the determination of effective and acceptable means to protect southern delta agricultural use and develop additional standards to protect this beneficial use, as appropriate.

d. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from striped bass survival standards and provide more appropriate protection for other fish species and aquatic life.

e. The State shall ensure that necessary studies are performed to provide a basis for additional standards which will supplement the protection derived from Suisun Marsh standards and provide more direct protection for aquatic life in marsh channels and open waters.

f. The State has studies underway to determine the water quality needed to protect beneficial uses of San Francisco Bay. These studies are scheduled to be used in a State Board standards review in 1986. The State shall develop standards based on any early conclusions of these studies as soon as possible. These will include standards that maintain the natural periodic overturn in the South Bay to protect the designated beneficial uses of those waters. In any case extensive review of Bay salinity standards shall commence no later than 1986.

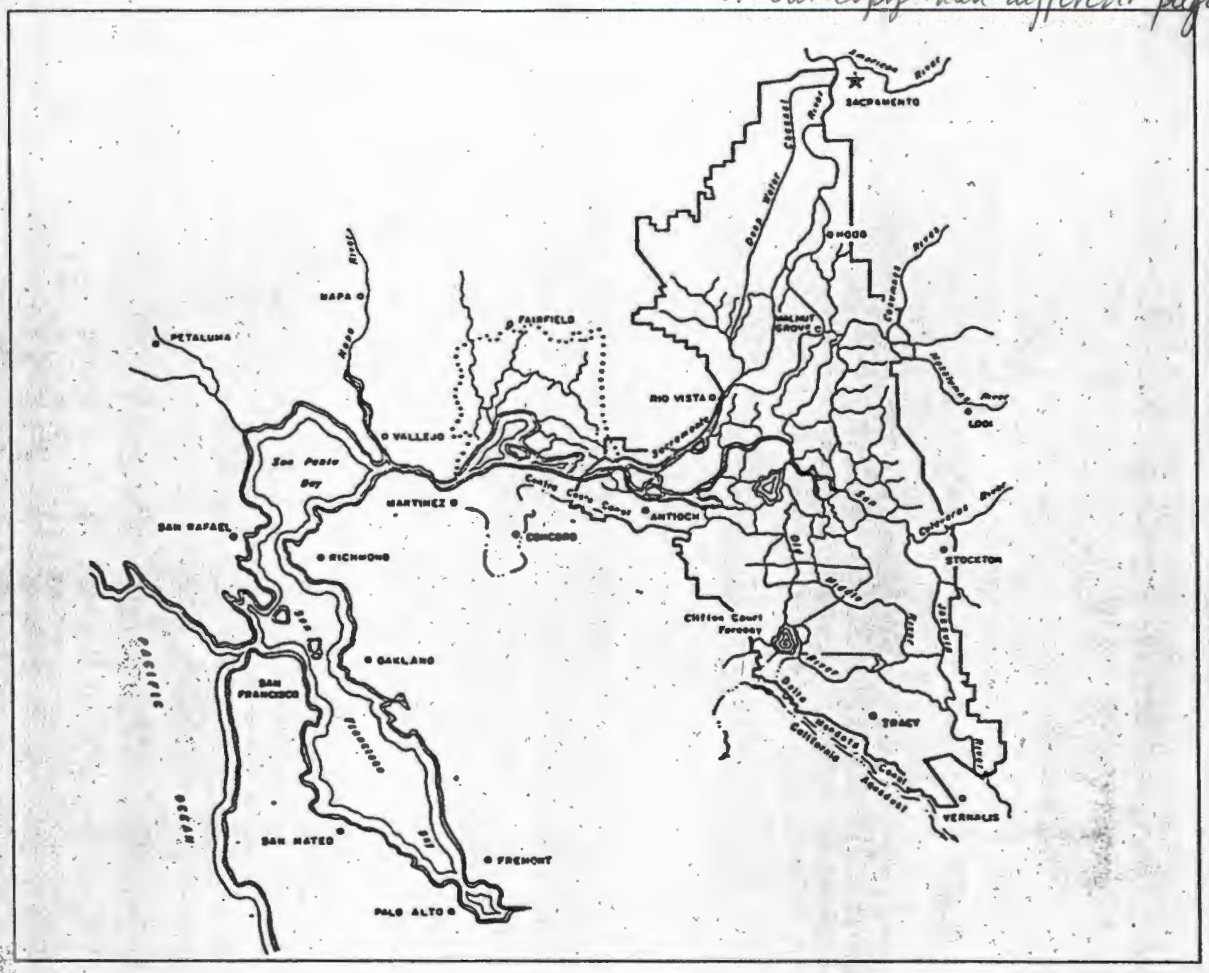
g. The State has studies underway to determine the effects of algal productivity in the estuary (including biostimulation) on water quality. These studies shall be used to develop standards to control excessive biostimulation in the estuary as soon as possible. Continued studies and modeling efforts to refine these standards shall be used to update these standards.

2. As part of the triennial review to be submitted to the State Board by August 1981, the State shall evaluate the following to determine what new or additional standards and/or plans of implementation shall be adopted to protect designated beneficial uses.

a) the water quality standards in Cache Slough at the City of Vallejo Intake to restore and/or correct any deficiencies in protection of designated beneficial uses that may exist there.

b) water quality standards to protect drinking water supplies from precursors of trihalomethanes. (e.g., salinity and organic materials).

NOTE: there are two versions of this document. Both are attached. The page citation in the letter was from the version faxed to us. Our copy had different pagination.



Appendix

RESPONSES TO COMMENTS ON THE DRAFT WATER QUALITY CONTROL PLAN (January 1991)

San Francisco Bay/ Sacramento - San Joaquin Delta Estuary

91-17WR

April 1991

WATER RESOURCES CONTROL BOARD
STATE OF CALIFORNIA

Comment: (Page 1-14, para. 1, also) USFWS cannot understand why the State Board cannot set a Vernalis spawning objective now, and implement it later, if indeed it is a desirable action. Objectives should be set realizing that it may take time and varied actions to achieve implementation (WQCP-USFWS-7,3).

Comment: (Page 6-20, Section 6.3.3, para. 3) USFWS's opinion is that the Final Draft text and their testimony support the extension of the spawning objective to Vernalis, with qualifications as to its implementation (WQCP-USFWS-7,6).

Response: The State Board remains unconvinced that extension of the striped bass spawning habitat upstream to Vernalis would produce any significant beneficial effects, given the present configuration and water project operations in the Delta. The Board remains open to further consideration of this issue in subsequent phases and in the Triennial Review.

No change in text.

Page 6-22, Section 6.5, Environmental Effects, paragraph 3

Comment: Two questions were asked: 1) if the Plan is essentially identical to the 1978 Delta plan, as inferred by the first bullet in Section 6.4, page 6-20; and 2) if the Environmental Checklist refers "...only to the adoption of the objectives or to their ultimate implementation?" (WQCP-USFWS-7,6).

Response: In answer to 1), other than the striped bass spawning objectives, the proposed Plan is essentially identical to the 1978 Delta Plan. In answer to 2), the Board has limited the discussion to the adoption of the objectives since the actual implementation methods will be determined in the upcoming phases of these proceedings and will be subjected to an environmental analysis at that time.

No change in text.

Pages 6-24 to 6-29, TABLE 6-5, Environmental Checklist

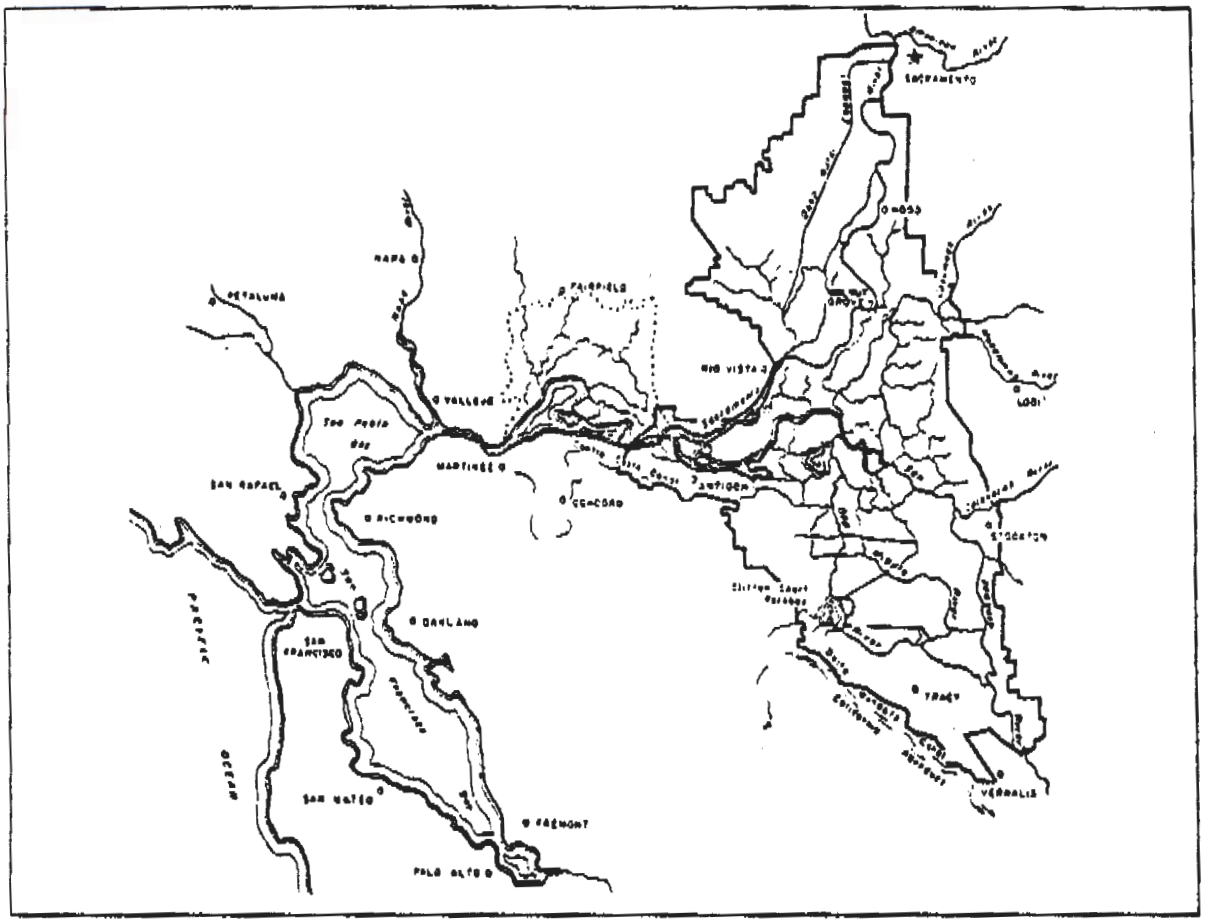
Comment: Questions were raised about some of the items in the checklist based upon the misunderstanding of the "-9" figure in Table 6-2 (WQCP-WACOC-54-6).

Response: See response to Page 6-5.

Pages 6-24 to 6-29, Environmental Checklist

Comment: There was disagreement with the "No" response for the following checklist items (WQCP-SWC-631,22):

3a. Changes in currents, or the course or direction of water movements, in either marine or fresh waters?
3h. Substantial reduction in the amount of water otherwise available for public water supplies?



RESPONSES TO COMMENTS ON THE DRAFT WATER QUALITY CONTROL PLAN (January 1991)

San Francisco Bay/ Sacramento - San Joaquin Delta Estuary

April 1991

WATER RESOURCES CONTROL BOARD
STATE OF CALIFORNIA

Page 6-22, Section 6.5, Environmental Effects, paragraph 3

Comment: Two questions were asked: 1) if the Plan is essentially identical to the 1978 Delta plan, as inferred by the first bullet in Section 6.4, page 6-20; and 2) if the Environmental Checklist refers "...only to the adoption of the objectives or to their ultimate implementation?" (WQCP-USFWS-7,6).

Response: In answer to 1), other than the striped bass spawning objectives, the proposed Plan is essentially identical to the 1978 Delta Plan. In answer to 2), the Board has limited the discussion to the adoption of the objectives since the actual implementation methods will be determined in the upcoming phases of these proceedings and will be subjected to an environmental analysis at that time.

No change in text.

Pages 6-24 to 6-29, TABLE 6-5, Environmental Checklist

Comment: Questions were raised about some of the items in the checklist based upon the misunderstanding of the "-9" figure in Table 6-2 (WQCP-WACOC,4-6).

Response: See response to Page 6-5.

Pages 6-24 to 6-29, Environmental Checklist

Comment: There was disagreement with the "No" response for the following checklist items (WQCP-SWC-631,22):

3a. Changes in currents, or the course or direction of water movements, in either marine or fresh waters?
3h. Substantial reduction in the amount of water otherwise available for public water supplies?
5a. Change in the diversity of species, or numbers of any species of animals ... ?

Response: The Board's "No" responses were based on the conclusion that there would be no adverse impacts due to the adoption of the water quality objectives. Beneficial impacts need not be discussed "...because the State Board has set the water quality objectives at levels designed to adequately protect the designated beneficial uses of the Sacramento-San Joaquin Delta and San Francisco Bay waters" (WQCP, p.6-29).

No change in text.

Page 6-31, last paragraph

Comment: The Board's conclusion that "[t]he availability of water for export uses is not significantly affected by this Plan" was questioned. The comment stated that "[t]he amount of water required to meet the objectives in the south Delta interior

U.S. FISH AND WILDLIFE SERVICE COMMENTS ON REVISED DRAFT - WATER QUALITY CONTROL PLAN FOR SALINITY - SAN FRANCISCO BAY/SACRAMENTO SAN JOAQUIN DELTA ESTUARY JUNE 1990

An oral summary of this written statement will be presented to the State of California, Water Resources Control Board by one or more Fish and Wildlife Service witnesses at the August 22, 1990 hearing.

WQCP-USFWS-5

EXECUTIVE SUMMARY

The Fish and Wildlife Service appreciates the opportunity to review the June 1990 draft Water Quality Control Plan for Salinity for the Bay/Delta Estuary.

The Plan describes the State Board's apparent commitment to take "intensive measures" to improve protection for the Estuary's declining biological resources.

The Service believes that comprehensive protection for fish and wildlife can only be achieved through the use of both water quality and flow objectives. We believe that the Plan should describe more specifically how flow, export and operational objectives will be part of the Board's actions to improve protection for fish and wildlife.

The Service believes that some of the proposed Draft Plan water quality objectives (Table 6-4) will afford better protection for fish and wildlife. Other proposed objectives would not afford the level of protection we believe is necessary.

Board proposed objectives that increase protection for fish and wildlife:

Salmon (dissolved oxygen)
Striped Bass (Salinity: 1. Antioch Spawning)
"Antidegradation"

Water Quality conditions that would better protect fish and wildlife:

Salmon (temperature) - Salmon would be better protected with a maximum surface temperature of not greater than 66 deg.F. that is provided from April 1 to June 30 at Vernalis and Freeport, and at Vernalis from September 1 to November 1.

Striped Bass (Salinity: 3. Prisoners Point - Spawning) - Striped bass spawning habitat would be better protected with an electrical conductivity level of no more than 0.44 mmhos/cm that is provided in all year types between April 1 and May 31 at six stations from Prisoners Point to Vernalis. This objective should not be implemented until entrainment losses and other adverse impacts caused by export pumping in the south Delta are corrected.

Suisun Marsh - Fish and wildlife resources of the tidal portions of Suisun Marsh would be better protected by the 1978 Delta Plan standards.

Other suggested improvements to the Draft Plan:

1. Utilize a more global perspective in setting sound water quality objectives to protect fish and wildlife with realization that implementation may require actions resulting from the water rights decision and other means.

2. Provide an explanation of the balancing criteria the Board will utilize in its final Plan and water rights decision.

3. Provide water quality and quantity objectives for fish and wildlife that are greater than minimum levels of protection. This will help avoid high risks to these resources since the objectives will be controlling more often as out-of-stream demands increase in the future.

4. Correct the impression voiced in the Plan that we don't know enough to act to provide for better fish and wildlife protection. The Board does have sufficient information to act.

5. Include in the final Plan the recent key report (1990) of the Department of Fish and Game (WQCP-DFG-3) that describes the major reasons for striped bass decline.

6. Utilize the Interagency Ecological Study Program to evaluate and to set priorities on future estuarine studies with appropriate review and input by the Board. Potential deficiencies in the Program could be corrected by Board Order.

7. Provide strong encouragement to the water development community to complete a verified, operational model for the San Joaquin Basin so that the benefits and costs of water management alternatives can be evaluated soon.

I. STATUS OF U.S. FISH AND WILDLIFE SERVICE PARTICIPATION IN THE PROCEEDINGS

The Service has been long involved in both study and planning for the protection of Bay-Delta fish and wildlife resources. The Service has been a member of the now 7-party Interagency Ecological Study Program (with an annual budget of $5 million) since its inception in 1971. Within the Interagency Program, the Service has the lead for management of the estuarine salmon studies. The Service testified on numerous occasions in the hearing leading up to the 1978 Delta Plan. In 1987, during the evidentiary phase of the present Proceedings, the Service testified before the Board on nine occasions and submitted many exhibits on the subjects of salmon, striped bass, other fish, San Francisco Bay, Delta wildlife, upstream fish and wildlife, pollutants, and the Program of Implementation.

In November 1988, the Board released a Draft Water Quality Control Plan that proposed strong protection for fish and wildlife resources which included the use of flow objectives. The November 1988 Draft Plan reflected, to a large degree, the needs of fish and wildlife identified by the Service and the Department of Fish and Game. The Service participated in hearings on the Draft Pollutant Policy Document. We presented testimony and submitted additional exhibits at the February 1990 workshops on Draft Plan chapters 2 through 5. We continue to participate heavily on the 5-Agency Salmon Management group and we attend various other workgroup meetings. Our commitment of resources has been substantial and commensurate with the importance of these Proceedings. Our consistent purpose has been to identify water quality and flow needs to protect fish and wildlife resources in the Estuary.

Our presentation in December 1987 at the Program Implementation Hearing topic was to identify flow and operational measures to protect a variety of fishery resources and their habitats. Included in that presentation were flow needs for Sacramento River smolt salmon; a Delta salmon temperature need; protection for San Joaquin River smolt salmon by maintaining a net downstream flow in the San Joaquin River at Stockton; elimination of reverse flows in the Lower Old, Middle, and San Joaquin Rivers; increased flows in the San Joaquin River at Vernalis; flows and operations to move and maintain striped bass eggs and larvae in Suisun Bay; and many others. Our recommendations at the February 22, 1990 workshop under a workplan narrowly focused on salinity, temperature and dissolved oxygen, supported a dissolved oxygen objective for the San Joaquin River of not less than 6.0 mg/l between September 1 and November 30; a water temperature objective not to exceed 66°F at Vernalis and Freeport; and striped bass salinity objectives much like the June 1990 Draft Plan except that we recommended protection upstream to Vernalis.

II. GENERAL COMMENTS ON JUNE 1990 DRAFT WATER QUALITY CONTROL PLAN FOR SALINITY

We are in agreement with the Board in its statements on page 1-5 (Executive Summary) of the Draft Plan: that (1) "biological resources have declined and are not experiencing the same degree of protection as other beneficial uses"; (2) "current water quality objectives have not produced the desired level of protection for biological resources"; and (3) "further, intensive measures are needed" (Page 1-5, Para. 3). We are also in agreement with the further statements in the Draft Plan where the Board (1) recognizes "the importance of restoration of aquatic habitat in the Delta" (Page 6-14, Last Para.); (2) acknowledges that "the upstream diversions and agricultural activities on the San Joaquin River System have had deleterious effects on aquatic habitat, both in terms of water quality and water quantity"; and (3) agrees that "these impacts to date have been largely unmitigated, particularly as related to the impacts in the Delta". (Page 6-15, Para. 3).

We conclude that the above statements mean that the Board is committed to taking strong corrective measures to improve protection for biological resources in the Estuary. We applaud that commitment. Our comments on the Draft Plan are meant to identify water quality conditions that are needed to help assure that fish and wildlife resources are fully considered in determining the appropriate level of protection.

We have a major concern with how the Draft Plan portrays the Board's intentions to consider the use of flow (as well as export curtailments and other operational measures) to address protection of beneficial uses in the Scoping and Water Rights Phases of these Proceedings. We believe that flow should be considered to not only attain water quality objectives in the Plan but also to protect beneficial uses not fully covered by the water quality objectives. Other such needs include the possible use of flow to correct for the negative impacts of diversions, to increase fish migration rate and to increase food production for fish and wildlife. A review of the revised July 20, 1989 Workplan for the Bay/Delta Proceedings provides, in our opinion, a clearer statement of the Board's commitment to deal with flow-related issues. The preface of that document calls attention to the Board's need to clarify that commitment.

III. WATER QUALITY OBJECTIVES

The following section expresses the Service's evaluation of the water quality objectives for fish and wildlife resources in the Draft Water Quality Control Plan.

Salmon (Dissolved Oxygen) - The Service believes that a minimum Dissolved Oxygen (DO) objective of 6.0 mg/l. in the San Joaquin River between Turner Cut and Stockton (per Table 6-4) is needed for the protection of salmon.

Salmon (Temperature) - The Service believes that salmon must not be exposed to a maximum surface temperature of greater than 66 deg.F. at both Vernalis and Freeport during the periods of April 1 to June 30, and at Vernalis from September 1 to November 1.

We believe that the 66 deg.F. maximum temperature value would result in better survival for smolts and help to prevent delay of adult spawners in the San Joaquin River Delta. We believe the April 1 to June 30 period is needed so that fall-run smolt protection is afforded throughout their primary migration period. The April period is included since smolts from the San Joaquin basin are at times exposed to warm temperatures as early as April. The period September 1 to November 1 reflects the primary migration period of San Joaquin adults and would help in any post-smolt migrations of fall- and late fall-run chinook. We see no apparent need at this time for a temperature objective during the months of July and August.

Fishery Habitat Protection (Entrapment Zone) - The Service believes the location of the entrapment zone can, in part, be characterized by salinity, but we believe it is best characterized by the magnitude of freshwater outflow. We note that considerable work is still being done by the Interagency Food Chain Committee to better understand the relationships of the entrapment zone to aquatic food production. Results of the work should be ready for discussion during the Scoping Phase of these Proceedings, and will address issues requested by the Board on P. 7-37 of the Draft Plan.

Striped Bass (Salinity:1. Antioch Spawning) - The Service believes that the Delta outflow and electrical conductivity levels and time periods described in Table 6-4 provide for improved spawning conditions for striped bass.

Striped Bass (Salinity:3. Prisoners Point - Spawning) - The Service believes that expansion of striped bass spawning habitat will increase the production of striped bass. We believe that an appropriate objective for an electrical conductivity level of no more than 0.44 mmhos/cm^2 to be met at six stations from Prisoners Point to Vernalis in all year types between April 1 to May 31 will improve spawning habitat for striped bass. However, expanding the striped bass spawning habitat without correcting the adverse impacts caused by water exports from the south Delta would not be beneficial and potentially could have a net adverse impact.

Striped bass in their spawning region are afforded only minimal protection under the 1978 Delta Plan. While the Draft Plan's proposed objective (Table 6-4) is of some slight improvement in the San Joaquin River at Prisoners Point, both in terms of EC and time period, the proposed objective is already met under present operations. Striped bass spawning is restricted to a relatively narrow reach of the San Joaquin River with marginal salinity conditions. Further, evidence indicates that striped bass have historically spawned in the San Joaquin River in the Delta and even upstream of the Delta prior to having their spawning habitat limited by high salinities upstream of Prisoners Point.

Given the present extremely low productivity of striped bass and the reduced adult striped bass population, we believe a comprehensive approach is needed to restore this valuable resource. Such an approach should include improving spawning habitat to assure maximum egg production and correction of the entrainment losses and other adverse impacts caused by export pumping in the south Delta. Low egg supply has been identified by the Department of Fish and Game as a major factor limiting restoration of the striped bass population.

The Service believes it appropriate for the Board to establish sound water quality objectives for striped bass spawning in this phase of the Proceedings. As noted in the text of the Draft Plan (p. 5-59, Par. 2), "in the context of the water quality control plan, these represent the only actions available to improve the striped bass situation".

The Racanelli decision, as described on page 2-5, directed the Board to take a global perspective of water resources in developing water quality objectives and to not view its salinity control function solely as a water rights function. It further states that the implementation process may be lengthy and complex and require significant time. Given that the Board recognizes the importance of restoration of Delta fisheries habitat, the Service believes expansion of the Prisoners Point salinity objective to Vernalis would be beneficial to fishery resources. This conclusion is further supported by the Draft Plan text on pages 6-24, last para. and 6-25, Para. 1.

We are aware that the test of reasonableness in setting water quality objectives is a key part of the balancing process governing use of the State's water resources, and thus support the need to refine operational studies to accurately define the water costs of extending the Prisoners Point objective to Vernalis. The Department of Water Resources has entered a report concerning this refined operational study into the record of these proceedings.

We will not, however, downplay the fact that restoration of the water quality in the Estuary to achieve the necessary protection of fish and wildlife resources will require additional water. We believe there is need for improved flow conditions in the San Joaquin Delta not only f striped bass but also for salmon smolt migration. We will further a ress

these flow needs during the Scoping and Water Rights Phases of these Proceedings. We believe salmon flow needs will likely be at least as much as that needed to meet the extended Prisoners Point (Prisoners Point to Vernalis) striped bass spawning objective.

Finally, the Service acknowledges that the primary negative factor adversely impacting juvenile striped bass production is that of south Delta project water exports. The Board's desire to restore Delta habitat and to protect the fishery beneficial uses in the Delta will require that those impacts be corrected during the Water Rights Phase of these Proceedings.

Suisun Marsh - The Draft Plan proposes adopting the Suisun Marsh Preservation Agreement "Normal" and "Deficiency" Standards (page 6 of 8 in Table 6-4). The Service believes that this proposal will not protect the tidal portions of Suisun Marsh. The 1978 Delta Plan standards (page 17 of 23 in Table 5-8) would better protect the tidal portions of Suisun Marsh.

The Draft Plan identifies two potential objectives for the Suisun Marsh: (1) the Suisun Marsh Preservation Agreement objective; and (2) the "antidegradation objectives" (1978 Delta Plan Standards). For the 85 percent of the legally-defined Suisun Marsh that is water-managed, the Draft Plan proposes objectives identical to the Suisun Marsh Preservation Agreement which includes "Normal Standards" and "Deficiency Standards". The Suisun Marsh Preservation Agreement "Normal Standards" provide acceptable protection for waterfowl resources on the water-managed portions of Suisun Marsh. The 1978 Delta Plan has standards that would better protect fish and wildlife on the 10,000 plus acres of tidal marshes compared to the Suisun Marsh Preservation Agreement.

"Antidegradation Objective" - The Service believes that the "antidegradation objectives" as stated in Table 6-4 (page 7 or 8) would provide better protection for Suisun Marsh fish and wildlife resources.

For all the marshes of the Suisun Bay area, the Draft Plan identifies the 1978 Delta Plan as the objective to satisfy the antidegradation policies of the Clean Water Act. The "antidegradation objectives" (1978 Delta Plan Standards) would override the Suisun Marsh potential objectives (Suisun Marsh Preservation Agreement) until sufficient study were accomplished to satisfy the antidegradation policies. Neither potential objective would, in our opinion, fully protect all marsh fish and wildlife resources.

Unfortunately, we do not have the information needed to prescribe an objective which fully protects all marsh fish and wildlife resources. Of the two, however, the "antidegradation objectives" (1978 Delta Plan standards) would better protect fish and wildlife resources. Our biological rationales for this belief are: (1) that there is no biological justification for the "Deficiency Standards" of the Suisun

Marsh Preservation Agreement; and (2) that the potential objectives for the Suisun Marsh Preservation Agreement do not completely address protection of fish and wildlife resources. Delta marsh resources are much larger than just the water-managed portions of Suisun Marsh.

IV. SPECIFIC COMMENTS

Page 1-6, para. 8 and 9:

The process by which the Board selects the level of protection of beneficial uses remains unclear to us. We are concerned because the fish and wildlife beneficial uses appear to be losing in this process. For example, this concern is exhibited on page 1-6 where the text states that "Delta Agricultural users should receive water quality that fully protects their needs..." while in the very next paragraph it states that "aquatic life in the Estuary should receive salinity and temperature levels that adequately protect this resource." (Emphasis added). In our view, terms such as "reasonable", "controllable", "fully", and "adequately" must be defined by the Board. We request that the Board explain in detail the criteria it utilized in developing the level of protection (i.e., chosen objective) for the final Water Quality Control Plan. Further explanation is needed to promote greater understanding and acceptance of the Board's decision.

Page 3-5 to 3-11, Section 3.2: The Draft Plan proposes a new Water Year Classification system. We are concerned that a change in the Water Year Classification system will work to the disadvantage of fishery resources. Dry year deficiencies have in the past been more frequently imposed on fishery flows than on water supplies for other beneficial uses. Section 3.2.1.4 states that the two systems are very similar. Table 6-2A, page 6-10, identifies a difference of only 5 and 13 thousand acre feet a year for the average annual and April through July averages respectively; a very small difference. Table 3-2 shows the impact of the classification change as most frequently causing a more dry classification when a class change would be made. This would result in less protection for fish and wildlife resources than the present classification system. We plan to carefully review any environmental documentation of the impacts from this proposed change. Possibly the fish and wildlife objectives could be upgraded to compensate for this change. We believe that a sliding scale could be the most appropriate approach to use in a water year classification system.

Page 3-16, section 3.4.4: The text describes water diversions, not Present Level Flow Conditions (i.e., instream flow conditions), as the section heading indicates.

Page 3-16, section 3.5.1: The text states that because the Kings River now only infrequently flows to the San Joaquin drainage, it is now considered to be part of the Tulare Lake Basin. We question whether the intent is to treat the Kings River differently from other San Joaquin tributaries in the Scoping and Water Rights Phase of these Proceedings. In our opinion, it should be considered appropriately for purposes of the Scoping and Water Rights Phase of these Proceedings.

Page 4-8 and 4-9, section 4.5: A characterization of estuarine habitat to sustain aquatic life and to provide spawning and migration functions seems limiting. We believe it would be useful to add a sixth beneficial use that relates to fish rearing and food production to include not only freshwater but brackish water habitat as well.

Page 4-9, para. 6, line 5: While there is much debate between water quality and quantity and fishery resource changes, that doesn't mean we don't know anything about the relationships. Such a statement adds to the false idea that we don't know enough to act to provide better protection for fish and wildlife. This misconception should be corrected in the Final Plan.

Page 4-25, third paragraph: We suggest that the following sentences be added to the text:

> "The United States Fish and Wildlife Service was petitioned by the California-Nevada Chapter of the American Fisheries Society on June 26, 1990 to list the Delta smelt as an endangered species. A Fish and Wildlife Service administrative finding on the petition request will be submitted to its Portland Regional Office by September 14, 1990."

Page 4-32, para. 1: The scientific names of two plant species should have the term "sub sp." inserted. In the third sentence the quotation marks on the words rare and candidate are unnecessary and it would suffice to simply say "both plants are Federal candidate species". The last sentence should be omitted and replaced with the following sentence: "California hibiscus (Hibiscus californicus) is another candidate species that might occur within the Suisun Marsh".

Page 4-32, para 3: change to read: "..., both the Department of Fish and Game and Fish and Wildlife Service are reviewing petitions to list the Delta smelt..."

Page 5-1, Section 5.3.3: This comment addresses in general the objective-level-setting process. When setting objectives for fish and wildlife protection, it is critical to know beforehand whether the objective is going to be the minimum allowable condition that should occur only irregularly and be of short duration, or whether the objective will often be controlling and/or of long duration.

It is our position, after reviewing the Draft Plan, Chapter 7, that the existing Water Quality Control Plan affords very poor protection for most estuarine fish and wildlife resources. In our opinion, the 1978 Delta Plan has as fish and wildlife standards mostly those type that provide only the minimum level of protection and should be controlling only irregularly or for short durations. Unfortunately, they have been controlling too often or they have been set so low that even higher standards for protection of other beneficial uses fail to incidently

protect the fish and/or wildlife resources. There is no contingency in those standards, they have not achieved what we all had hoped that they would achieve, and the Board should not allow future standards to be set at such high risk levels.

Fish resources have declined dramatically as a result of poor estuarine habitat. The future prospects for Delta conditions is such that water projects operations will increasingly result in Delta hydrologic conditions nearing and meeting the minimum levels of protection. Without improvement in protection, the prognosis is for continued declines in fishery habitat and populations. Therefore, it would be helpful if objectives and future standards were set at more appropriate levels that provide better protection for fish and wildlife resources.

Page 5-23, para. 1, line 5: The statement that any salinity at any location in the Delta would be acceptable is doubtful. Young chinook salmon (particularly fry) that rear and migrate to the Delta would not be able to tolerate high salinities and would likely be harmed by a sudden rise in salinity.

Page 5-23, para 2: The text indicates that the San Joaquin salmon population are only undergoing extreme fluctuations. Natural populations of San Joaquin salmon are also declining, and the text should so indicate. Department of Fish and Game Exhibit 15 reflects a decrease in production from historical levels.

Page 5-23, para 2, last sentence: As written, this sentence seems to contradict the previous one. We suggest that the sentence be rewritten to read: "Catch of fall-run chinook salmon has been generally stable over time because of the increasing numbers of hatchery-produced fish offsetting the decline in naturally-produced fish".

Page 5-23, para 4: The text ignores the effects of water temperature on San Joaquin smolt salmon and focuses on flow considerations. While flow is important, temperature also is of concern for smolts. The temperatures in the South Delta are often too high for smolts. The text should be expanded to discuss this important aspect of present conditions.

Page 5-26, top of page: The reference to the Upper Sacramento River Fisheries and Riparian Habitat Management Plan including "priority issues such as flows" needs elaboration. We believe it misleads the reader to think that flow issues will be corrected to some extent by plan implementation.

Page 5-29, para. 2: Late summer also is a temperature-critical period for incubation and rearing of winter run chinook.

Page 5-29, para. 3: We are not sure that the temperature in the Sacramento River has been 2 to 3°C higher since 1978. We suggest

further review of this data. Use of the new Bureau of Reclamation water temperature model for the Sacramento River may allow us to estimate how temperatures may have changed historically during periods critical to salmon. We suggest such an evaluation be performed.

The paragraph also implies that only Sacramento River basin hatchery fish are affected by high temperatures. This is not true. Both wild fish and hatchery fish from both systems are vulnerable to loss from high temperature. The effect on San Joaquin River stocks is clarified at the end of the paragraph. However, it should be noted that wild Sacramento River fish also come out in late May whereas hatchery Sacramento fish are migrating in early to mid-May (i.e., Coleman in-mass fish releases, See paragraph 1, page 5-33).

Page 5-32 - Text Table: We do not believe that late fall run chinook salmon smolts are able to tolerate the warm temperatures of the lower Sacramento River in August and early September. Winter-run are fry, not smolt-sized, in September and October.

Page 5-32, last sentence: It is important that a review be made of the Bureau of Reclamation Sacramento River basin temperature model of June 1990 to help clarify further the factors influencing water temperatures in the Delta. The Bureau of Reclamation has indicated that this model will be entered into the record as an exhibit during the August 1990 hearings on the June 1990 Draft Plan. As noted on Page 5-33, of particular interest is the role of flow in managing lower water temperatures under the different water year types. This issue needs clarification so that accurate assumptions can be made in decisions relative to salmon and their temperature needs and the careful balancing needed in use of water to protect fish and wildlife.

The Five Agency Salmon Management Group is evaluating the costs/benefits of decreasing water temperature and the use of other measures in the Delta to improve salmon smolt survival. Results of that effort will be available for the Scoping Phase of these Proceedings.

Page 5-33, paragraph 2: The text describes the recent four years of springtime operations to improve outmigration survival of Coleman National Fish Hatchery smolt salmon as an experiment. The "pulse flow experiment" was fully operational. The operation was conducted because it was known it would have a beneficial effect. What was created were spring flow conditions that were improved but nonetheless substantially less than what would have occurred under natural conditions. The Service reported in part on this issue in our 1988 and 1989, Stockton FAO Annual Progress Reports submitted to the Board as exhibits WQCP-USFWS-2 and WQCP-USFWS-3 on February 22, 1990.

Page 5-37, para. 3, last line: We believe that the results of recent evaluations by Department of Fish and Game staff (WQCP-DFG-3) on the bass decline should be fully described in this Plan.

Page 5-37, last line: We suggest "and greater curtailments of spring and early summer exports" be added to this sentence after the word "outflow" and before the word "for".

Page 5-37, Present Conditions, para. 2: In large part, the reasons for the striped bass decline are known. While the exact importance of each factor is not known, the major factors are known. For purposes of these proceedings the effects of Delta diversions and exports should not be downplayed.

Page 5-47, para. 1: The Department of Fish and Game Striped Bass Restoration Plan, while useful, is not the more recent 1990 Report of the Department of Fish and Game entitled "Where Have California's Striped Bass Gone?" (WPCP-DFG-3) that specifically addresses the bass decline. The findings of this latter report must be reflected in the Water Quality Control Plan. Of critical interest is the fact that the report indicates that survival of juvenile bass can be explained for the entire period of record using outflow and export and that egg supply appears limiting due largely to low adult populations. Low recruitment to the spawning stocks in the late 1970's apparently reflects high losses of young bass when south Delta exports increased in the early 1970's.

Page 5-61, para. 3: The text should state that the temperature objective for salmon may serve to protect American shad to some degree.

Page 5-62, Advocated Levels of Protection, para. 2: We again suggest that the reference to the petition for Federal listing be added as commented on for page 4-25, above.

Page 5-65, para 3: The Draft Water Quality Control Plan states that there is not sufficient information to set an EC or salinity objective for Delta smelt spawning. While it is true that we do not know precisely the level of salinity that separates acceptable and unacceptable spawning conditions, existing knowledge suggests that salinities of 2 ppt or less are needed in Suisun Bay from March through June. The same needs exist for protection of the Delta smelt nursery in Montezuma Slough.

Page 6-9, Section 6.2.2, Errata Sheet: A review of this errata sheet and Table 6-2A appears to indicate that the additional San Joaquin River flow used to meet the Prisoners Point to Vernalis striped bass spawning objective would provide for additional export. As the Service has noted earlier, extending the spawning region while continuing high exports in the south Delta most likely will not have a net benefit but could cause further damage to bass production. Correcting the negative impacts of Delta exports on bass is essential to restoring the Delta habitat for striped bass and must be done along with the extension of the spawning region to Vernalis. It would be useful to know the water cost of

meeting the Prisoners Point to Vernalis spawning objective when no exports are made from the south Delta.

Page 6-11, Figure 6-1: Use of the term "Surplus" to describe flow above the minimum required and carriage water needs is inappropriate. The term "Surplus to Standard" would be more appropriate and should be used in lieu of the term "Surplus".

Page 6-14, Section 6.4: The first two sentences imply that inconsistent recommendations cause problems for the Board in setting objectives for the protection of aquatic habitat in the Delta. It should not. The word "however" was inappropriate to begin the second sentence. As noted, both the Service and the Department of Fish and Game agree that the expansion of appropriate habitat would be beneficial to striped bass restoration in the long run. The difference is simply a matter of process in achieving the goal, not the goal itself.

As noted in the Draft Plan, and well supported in para. 2 on page 5-59, "...in the context of the Water Quality Control Plan improved spawning habitat represent the only actions available to attempt to improve the striped bass situation. They represent the first step toward long-term resolution of the problem, as opposed to short-term or interim." The Service desires a long-term solution to the striped bass problem.

Page 6-16, Section 6.5 and Table 6-3: We are at a loss in finding significant value in this section. On page 6-16 the text states that "regardless of the set of objectives adopted, the Plan will not have any significant or potentially significant effects on: ...recreation". We see the Plan as potentially having significant adverse impacts upon sport and commercial fishing. In the Environmental Checklist, items 5a, b and d are characterized as "?" (i.e., maybe). Item 19 of the checklist states that no impact to recreation would occur but we believe fishing success and effort will be impacted.

Page 7-1, para. 2: Again, there is a need to clearly state that the Scoping and Water Rights Phases will not be limited to the use of flow only to implement the Water Quality Plan objectives. The use of flow can be an appropriate means to better protect fish survival, production, etc., via the decreased impacts of diversion and to correct other negative impacts. The wording in the Draft Plan makes it appear that flow itself may likely not be used as a means to protect fish unless it is viewed as a means to meet a water quality objective. Specific examples of conflicting wording are found on pages 1-1, last para; 2-2, last para; 2-3, para 3; 7-1, para 2; and 7-3, para 2, 3 and 4. As noted earlier, a review of the revised July 20, 1989 Workplan for the Proceedings gives better clarification on this issue (See Preface and page 7, 8 and particularly 10). The phrase "consider flow requirements that differ from the 1978 Delta Plan" included in the Workplan and meant to show the Board's committment is unclear in meaning. Please explain or use another phrase in correcting this problem.

Page 7-2 and 7-3: The Draft Plan explores a concept of expanding water rights responsibility to parties operating reservoirs of a certain minimum size (e.g., 100,000 acre- feet). In our opinion, expanding responsibility simply to any diverter of a certain quantity of water is far more appropriate. Some water users make no use of conservation storage facilities yet are relatively large consumers of water (e.g., in-Delta diversions).

Page 7-3, para. 4: Once again, the text could be interpreted to mean that implementation measures are only those related to the Water Quality Control Plan objectives, and not to the use of flow to improve protection for fish beyond those of water quality objectives.

Page 7-3, para. 5: This paragraph appears to make a clear distinction between flow needs (1) to protect beneficial uses, and (2) to attain water quality objective. We believe that this distinction should be absolutely clear throughout the Final Water Quality Control Plan.

Page 7-6, para. 1: The comments on initiation of measures to lower water temperature are unclear. What is meant by "maintain cool waters by the beginning of the Water Rights Phase"? This paragraph is unclear as written and will cause great difficulty among the participants. The conditions when the Board will direct water users to meet the objectives must be explained further.

The temperature effects from discharges from the Colusa Drain and Sacramento Slough need to be carefully evaluated. Phase 1 testimony identified the Colusa Drain as responsible for particularly large accretion of warm water in the middle Sacramento River where conditions are often marginal at best.

Page 7-6, para 3: This section infers that the Board will extend the Prisoners Point spawning objective to Vernalis. We believe this objective will be beneficial to striped bass.

Page 7-11, para. 4: Continuous temperature recorders may be useful at other sites below Vernalis and Freeport (e.g., Isleton, mouth of Mokelumne) to document how Delta temperatures vary through time and space. This additional monitoring would provide a record of present day conditions to compare with any future potential changes in operations and facilities.

Page 7-12, Section 7.3, Special Studies: The Draft Plan provides extensive suggestions for needed studies of biological resources. These will be considered as part of the Interagency Ecological Study Program planning for 1991 and subsequent years. We believe that it is useful for the Board staff to continue to participate in this planning-priority-setting process. Our three year program statements and 1991 program plans will be available for review during the Scoping Phase of

these Proceedings. The Interagency Program utilizes diverse advisory panels to aid in developing our study plans.

Page 7-15, para 3, last sentence: This is an appropriate goal but it should be added that temperature models would be used and developed to document how and to what degree runoff affects water temperature under various water-year types.

Page 7-15, para. 4, last sentence: It is important to note that smolt survival estimates are gained the same spring by trawl recovery at Chipps Island and the environmental effects on survival are available the same year. The effect of various conditions on adult escapement take at least 2 1/2 years to document and are more difficult to assess due largely to the varied effects of ocean life on escapement (natural and harvest mortalities) and inherent sample variability and biases.

Page 7-17: Research studies on the timing of winter-run fry and smolt migration in the Delta are being conducted by the Interagency Estuarine Salmon Program. These studies began during the winter of 1989-90. Preliminary study results will be available in the fall of 1990. Plans are to continue this effort.

Page 7-17, Striped bass, para. 1: The inference is that because many participants disagree on courses of action to take in response to the striped bass problem, it appears we know little about the species. Much is known about the species and what key actions would be effective in improving habitat conditions to help restore bass production. The participants in these Proceedings simply cannot agree on the appropriate measures needed to correct the problem.

Page 7-17, para 2, line 4: We are very concerned about the statement that it appears we know little about striped bass. The paragraph leaves the impression that it is hopeless to do anything until we do more studies. Uncertainty will always be with us in fisheries science, but given the exceedingly poor environment that striped bass currently must attempt to live in, improved protection is warranted and the need has been sufficiently documented.

Page 7-32: The Service encourages that further studies be done to better document the response of chinook smolts to water temperature. Potential studies include those designed to measure physiological stress, the use of caged fish, and the continued use of coded-wire tag smolt releases under varied temperatures.

U. S. FISH AND WILDLIFE SERVICE

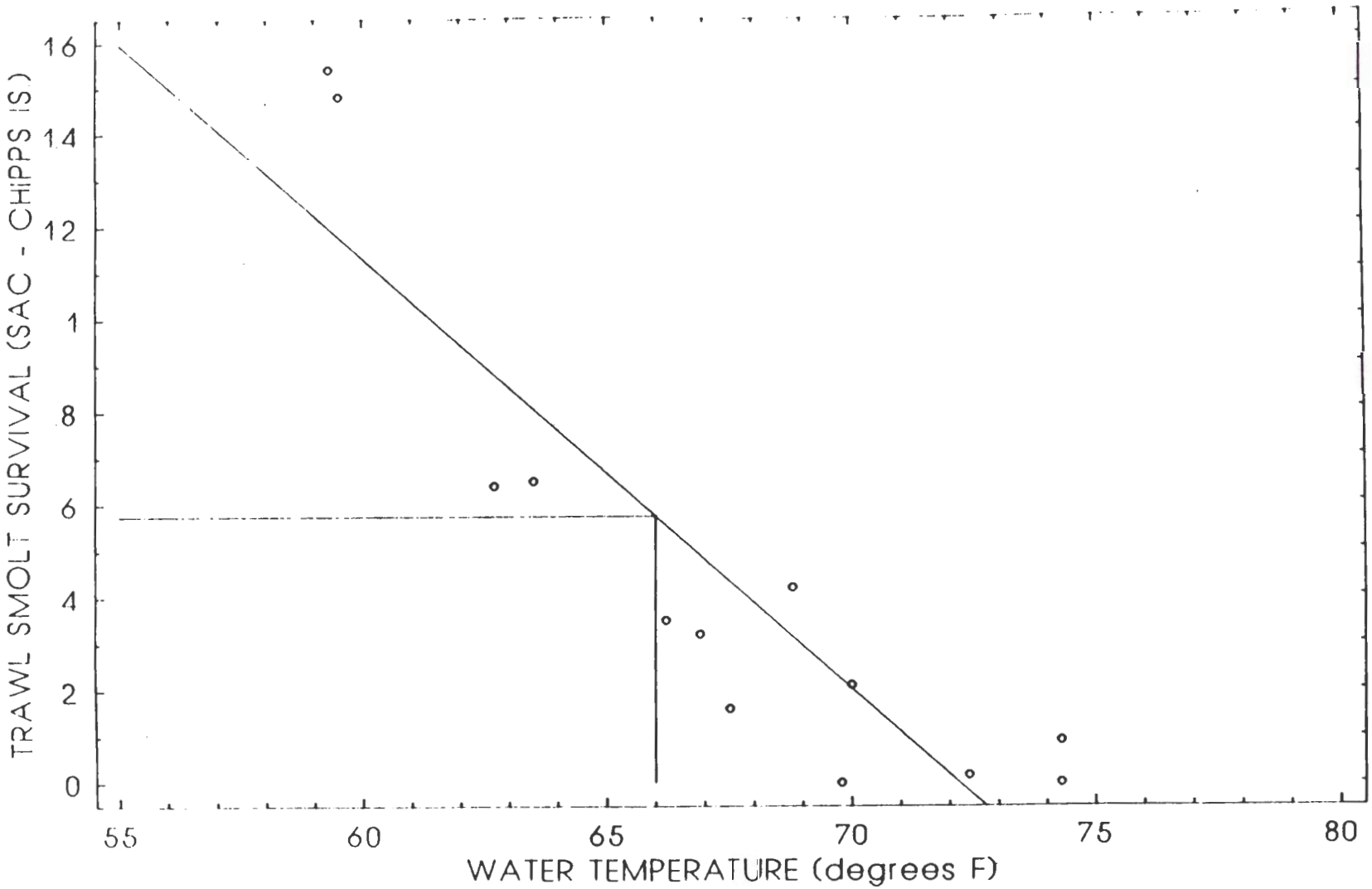
FIGURES SUPPORTING AUGUST 22, 1990

TESTIMONY OF PATRICIA BRANDES

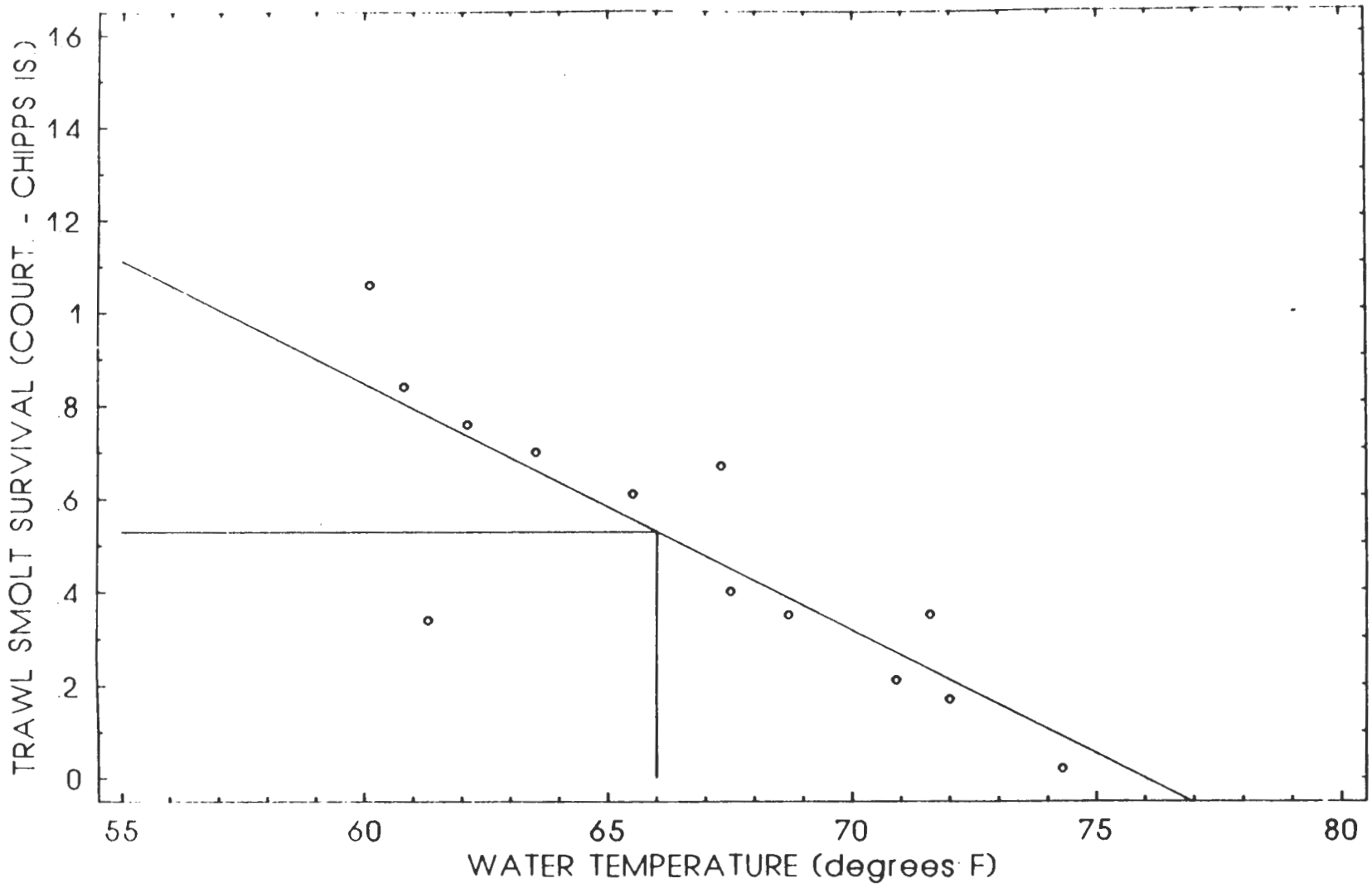
(9 Figures identified as

6a through 6i)

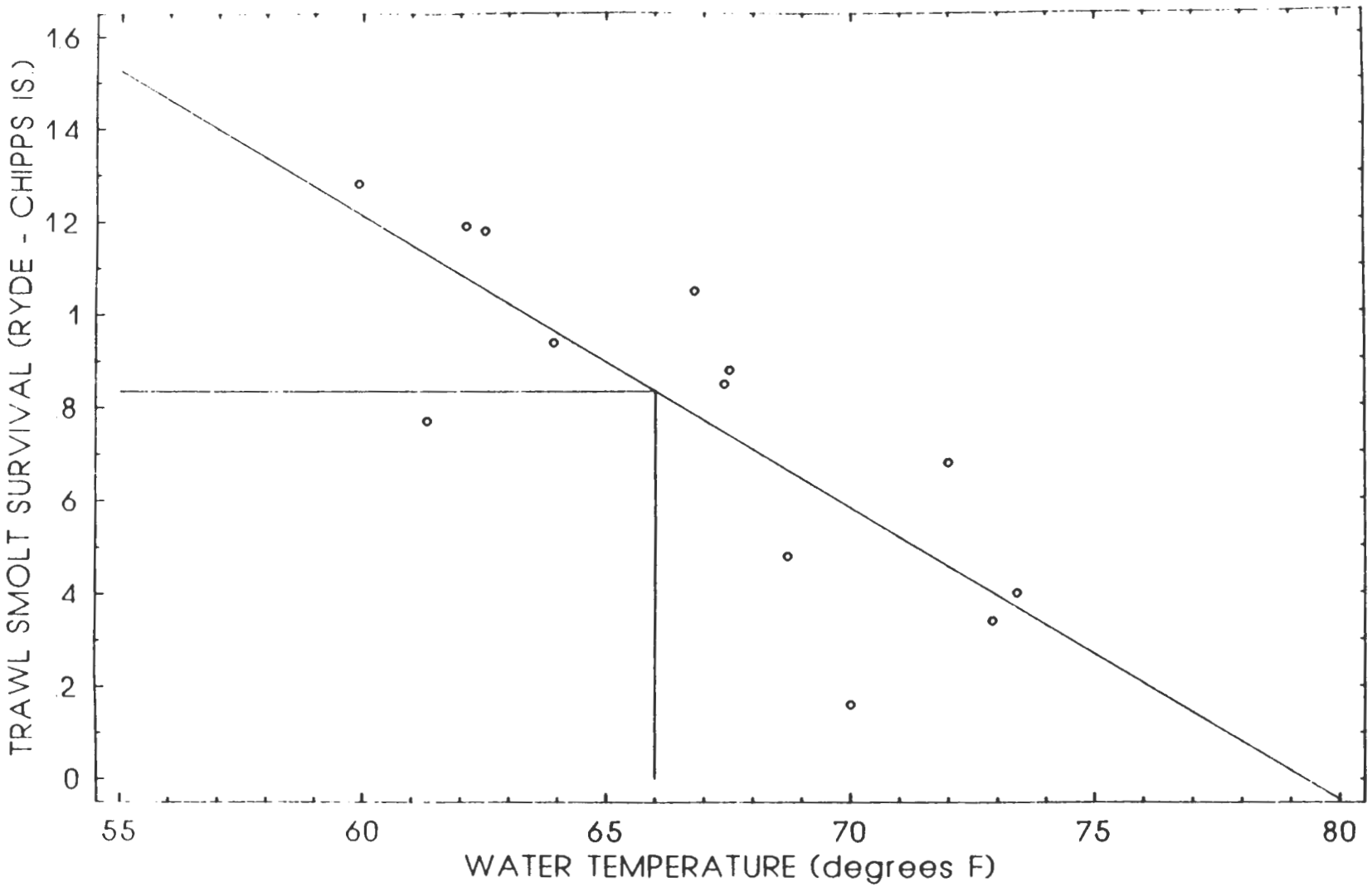
WQCP-USFWS-6



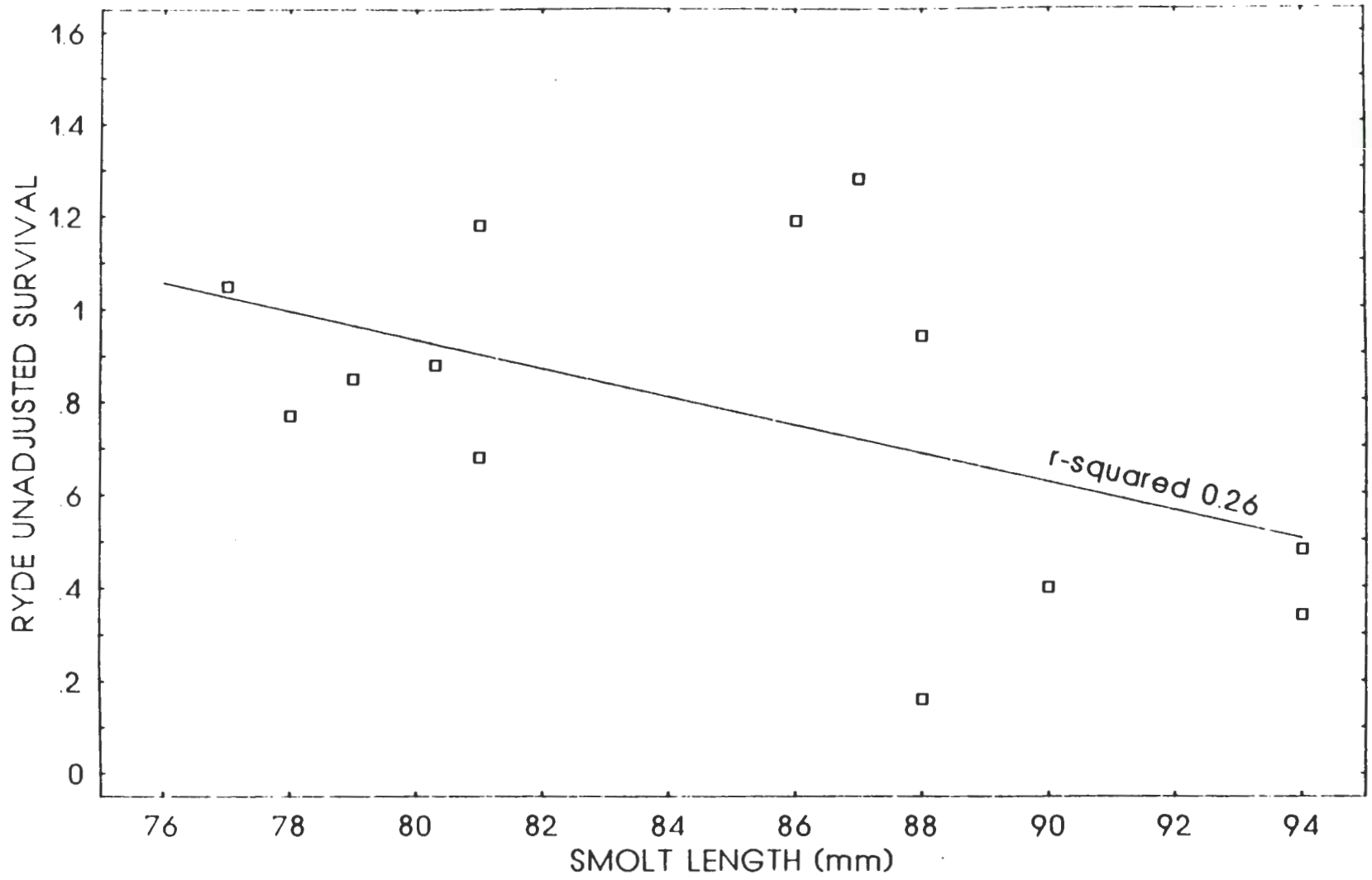
CHINOOK SALMON SMOLT SURVIVAL, CALCULATED FROM SACRAMENTO RELEASES, VERSUS SACRAMENTO RIVER WATER TEMPERATURE AT FREEPORT



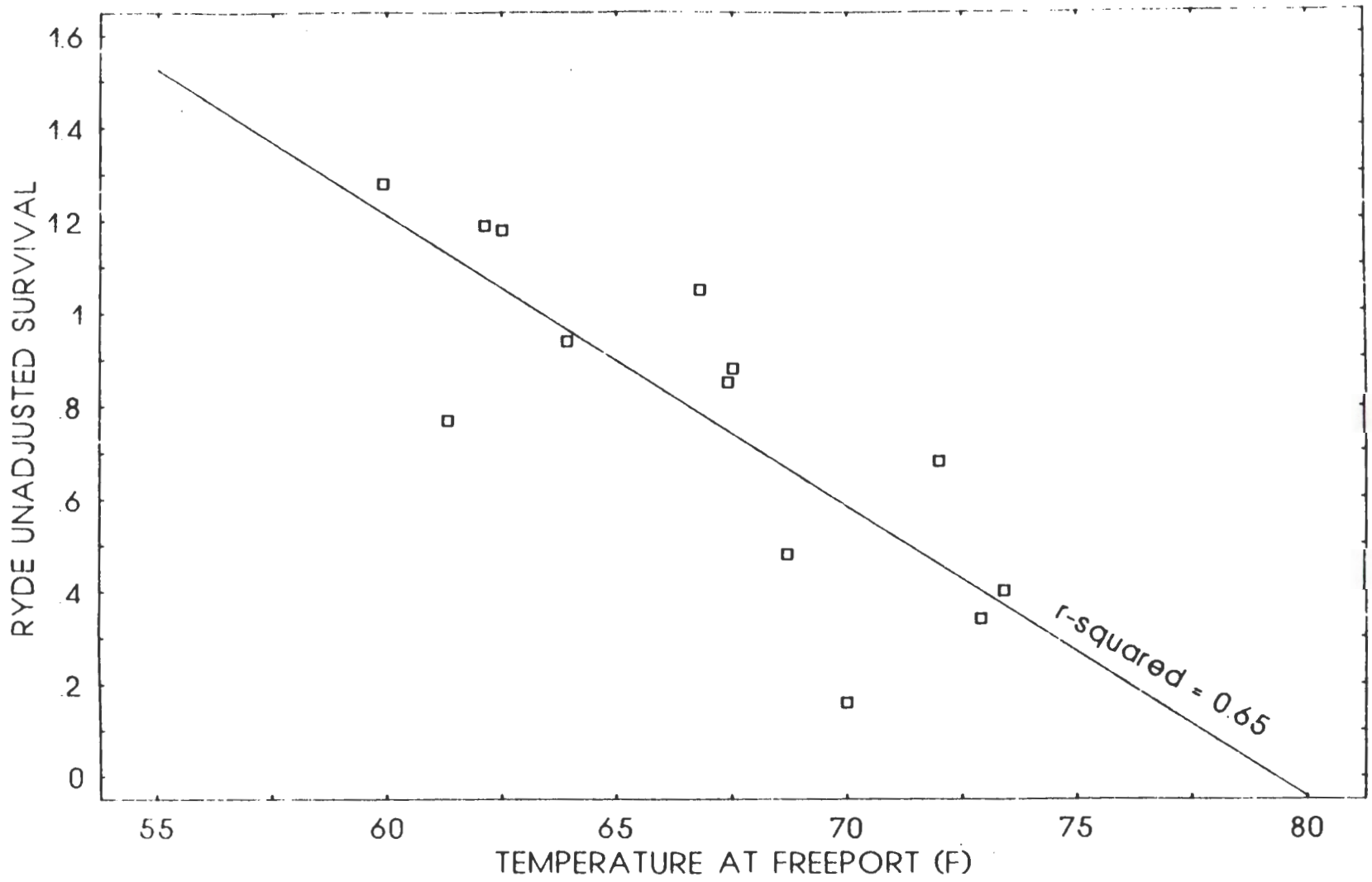
CHINOOK SALMON SMOLT SURVIVAL, CALCULATED FROM COURTLAND RELEASES, VERSUS SACRAMENTO RIVER WATER TEMPERATURE AT FREEPORT



CHINOOK SALMON SMOLT SURVIVAL, CALCULATED FROM RYDE RELEASES, VERSUS SACRAMENTO RIVER WATER TEMPERATURE AT FREEPORT



CHINOOK SALMON SMOLT SURVIVAL, CALCULATED
FROM RYDE RELEASES, VERSUS LENGTH
OF SMOLTS AT TIME OF RELEASE



CHINOOK SALMON SMOLT SURVIVAL, CALCULATED FROM RYDE RELEASES, VERSUS SACRAMENTO RIVER WATER TEMPERATURE AT FREEPORT

6e

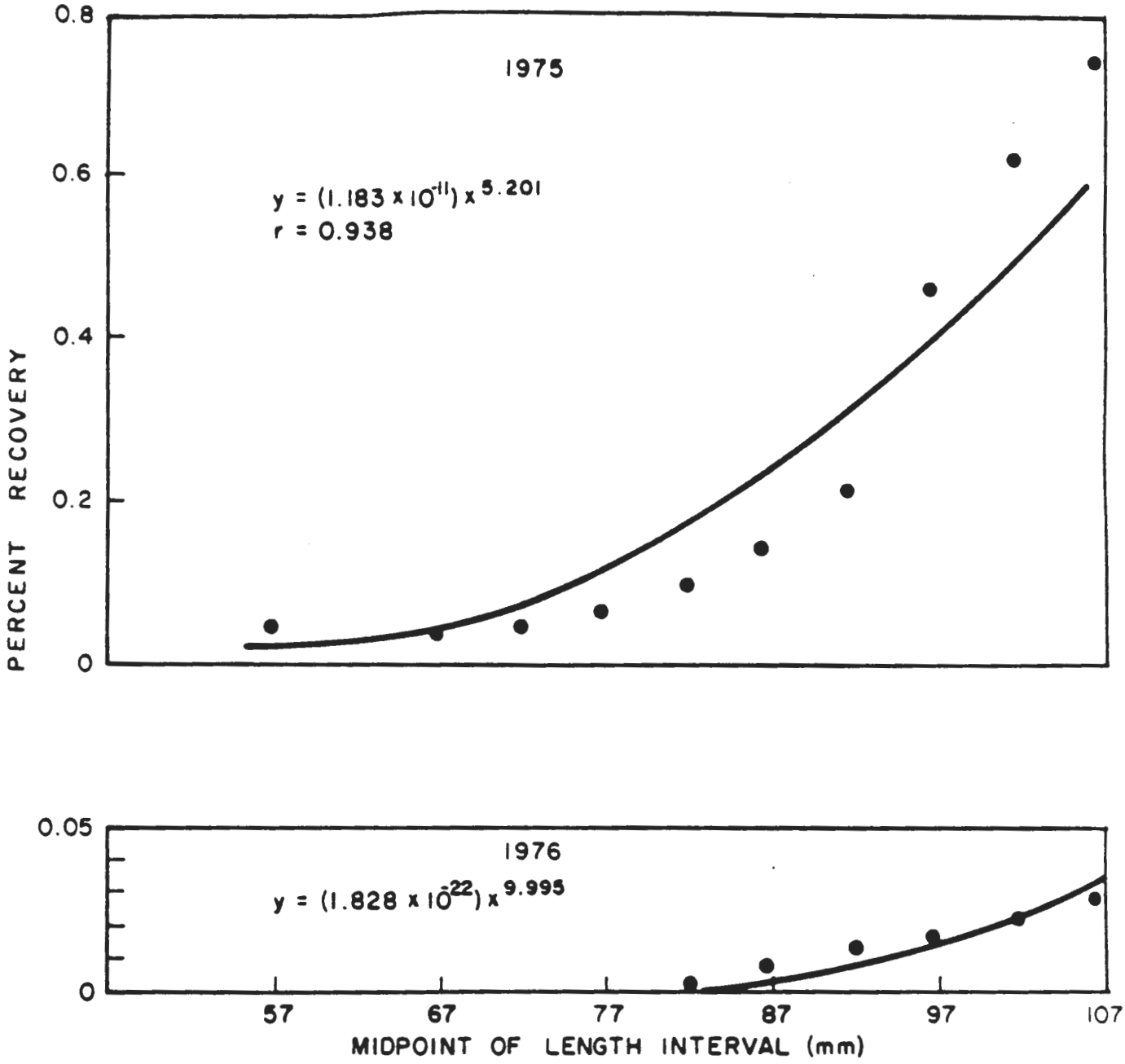
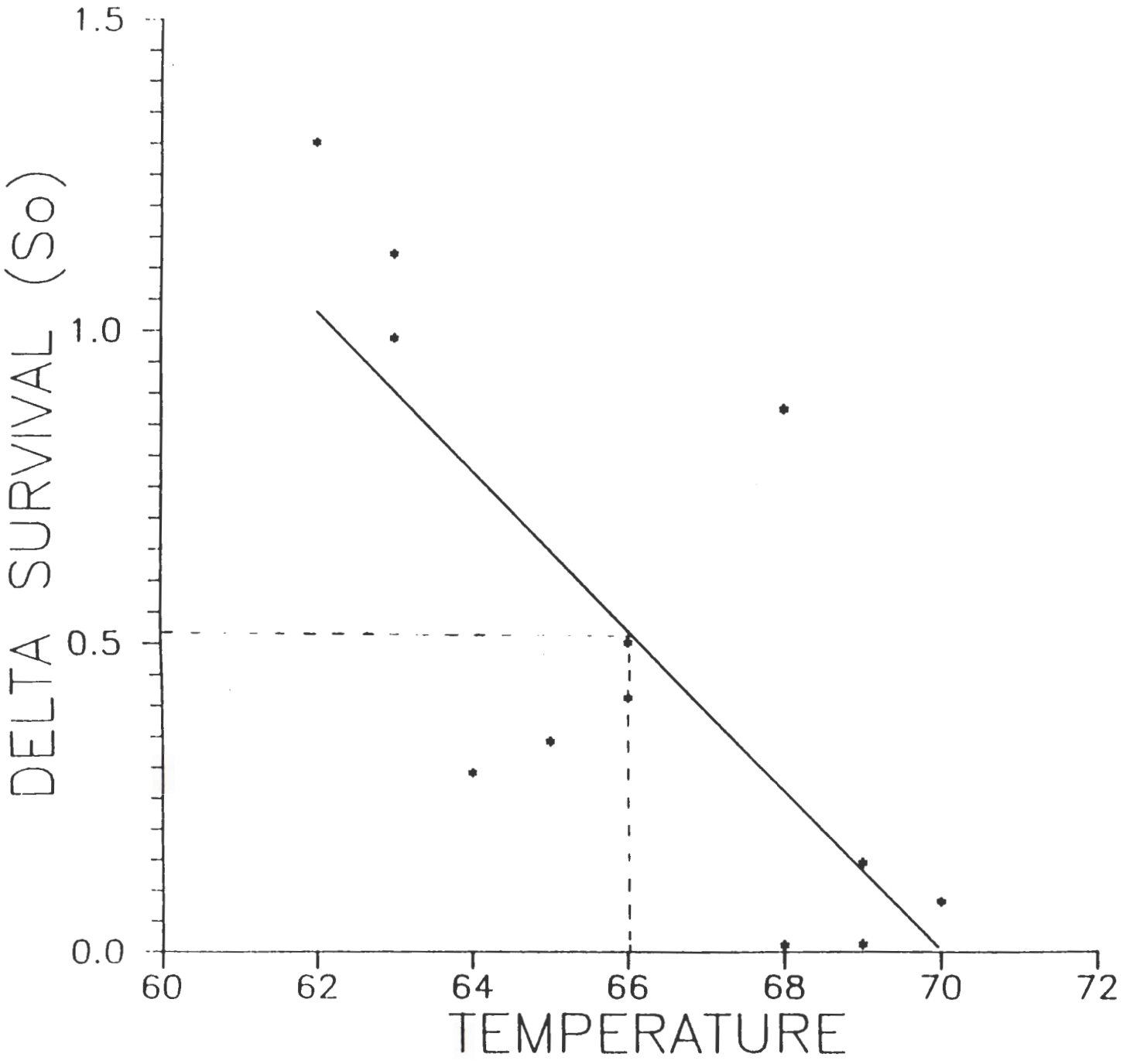
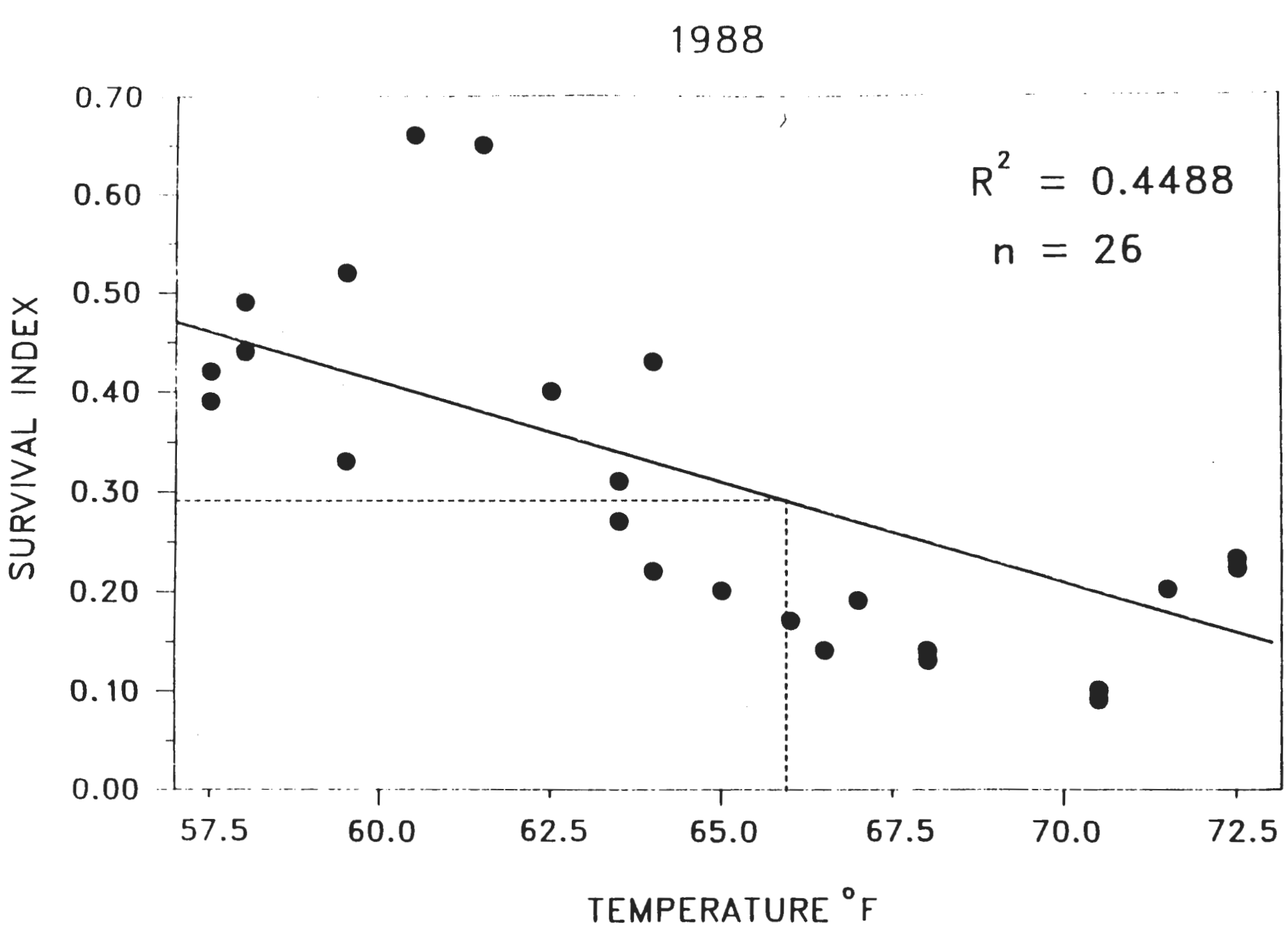
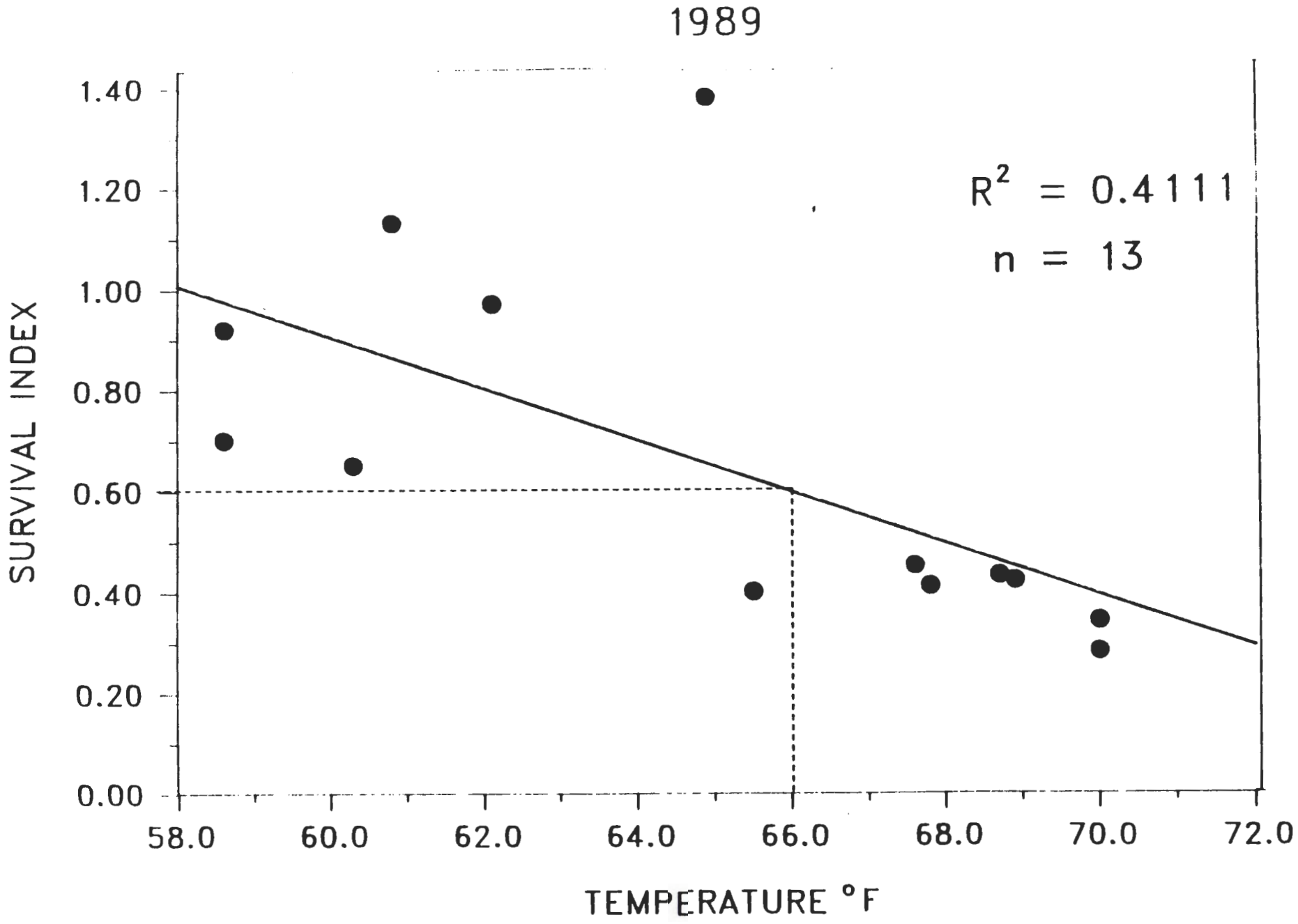


FIGURE III-14 RETURN PERCENTAGES FOR YOUNG SALMON RELEASED BELOW THE RED BLUFF DIVERSION DAM ON THE SACRAMENTO RIVER. RETURN PERCENTAGES ARE BASED ON RECAPTURES OF MARKED FISH IN MID-WATER TRAWL TOWS AT CHIPPS ISLAND IN THE SACRAMENTO-SAN JOAQUIN ESTUARY.


DELTA SURVIVAL (So)
1.5
1.0
0.5
0.0
60
62
64
66
68
70
72
TEMPERATURE


1988
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
SURVIVAL INDEX
R^2 = 0.4488
n = 26
57.5
60.0
62.5
65.0
67.5
70.0
72.5
TEMPERATURE °F


1989
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
SURVIVAL INDEX
R^2 = 0.4111
n = 13
58.0
60.0
62.0
64.0
66.0
68.0
70.0
72.0
TEMPERATURE °F

Comments on Draft Water Quality Control Plan for the Bay-Delta Estuary[1/]

INTRODUCTION

I welcome the opportunity to appear before you today to present the Department of Fish and Game's comments on your Draft Water Quality Control Plan for the Bay-Delta Estuary. Before commenting on the specifics of the draft plan, I want to make a few comments about the context in which we view the plan.

We consider the primary fish and wildlife issues before the Board in the Bay-Delta proceedings to be questions associated with the direct effects of flow, diversion rates and facility operations of the water projects. We think that belief is generally shared by all parties participating in the hearings.

It was because of that belief that we recommended last spring that you consider going directly to the water rights phase of these proceedings. We can appreciate why you did not accept our recommendation, but our goal in participating in the water quality phase will be to comment constructively on the fish and wildlife issues addressed in the plan and urge you to move on quickly to the water rights phase so a comprehensive management plan combining water quality and flow needed for fish alnd wildlife protection can be addressed.

The review of the draft plan has not caused us to modify recommendations made to the Board during Phase I, except for the comments we will present on temperatures for salmon and a concern about the new water year classification on the frequency of deficiency periods in Suisun Marsh.

COMMENTS ON THE DRAFT PLAN

Fishery Habitat Protection (Plytoplankton and Zooplankton)

The Department considers productivity, particularly in the entrapment zone, to be a very important issue, but we propose to continue to deal with it primarily through the needs of striped bass and other fishes and consider it acceptable to treat it as a flow issue.

1/ Presented to the State Water Resources Board's February 20-27 Workshop on behalf of the Department of Fish and Game by Pete Chadwick, Program Manager, Bay-Delta Project.

Salmon

a) The section on "Advocated Levels of Protection" should recognize the recent legislative direction in SB2261 to strive to double present populations by year 2000. In planning to implement SB2261, the Department has established goals as follows:

1. Upper Sacramento River

Stock	Ocean Catch	In River * Escapement	Total adult Production
Fall	600,000	300,000	900,000
Late Fall	50,000	25,000	75,000
Late Winter	42,000	70,000	112,000
Spring	105,000	70,000	175,000
	797,000	465,000	1,262,000

*Portions of In-River Escapement will be harvested by Delta and river sport anglers.

2. Lower Sacramento River

Production numbers will be developed as spawning and rearing habitat assessments are completed.

3. San Joaquin River

Stock	Ocean Catch	In River ** Escapement	Total Adult Production
Fall	317,000	158,000	475,000

The draft plan should recognize these goals.

*The potential exists to establish a spring-run of chinook salmon in the Stanislaus River.

**DFG estimate that about 40,000 fish in the in-river escapement will be available for sport angler harvest.

b) Although there are certain technical issues concerning the information presented in the draft on the relationship between water temperature and the survival of salmon smolts, we believe it justifies a conclusion that temperatures in the high 60's or higher are detrimental. Thus, it provides additional justification for a temperature objective currently in the Central

Valley Basin Plan. That objective calls for a temperature of "68° in the reach from Hamilton City to "I" Street Bridge during periods when temperature increases will be detrimental to the fishery". We recommend that this objective be extended to Freeport on the Sacramento River and also be established at Vernalis on the San Joaquin River.

We understand the context of that objective to be that actions should be taken to alleviate controllable factors causing temperatures to increase. We consider that to be the appropriate context, rather than establishing an absolute maximum as would be done by the alternatives described in the draft report.

c) We endorse the dissolved oxygen alternative proposed for salmon in the San Joaquin River below Stockton as described on page 5-71.

d) Recent information indicates that the estimates of the sport catch of salmon in both the ocean and river are substantially higher than stated on page 4-29. Our estimates of ocean sport catch and harvest are:

Year	Total Angler Days	Catch of Central Valley Salmon
1985	108,000	111,000
1986	128,000	115,000
1987	156,000	153,000
1988	151,000	131,000
1989	145,000	123,000
Mean	137,600	126,000

We don't have comparable estimates of the river catch, but partial results from a recently established survey indicate a catch substantially greater than the 35,000 stated in the draft.

Striped Bass

a) The overall conclusion that the Delta is less a desirable nursery area than in former years (p4-32) is reasonable considering the location of the water project pumps and their apparent impact on striped bass (DFG exhibit 25). However, the decline is not limited to San Joaquin River as suggested on page 4-32. The problem is Delta-wide and first became evident in reduced abundances of young bass in the lower San Joaquin River during the 1970's.

b) The report has a good description of issues associated with Striped Bass Index (p 5-78 to 5-81) and should help dispell some public misconceptions.

c) The section on possible reasons for the striped bass decline inappropriately lists all of the problems described in our striped bass plan as potentially contributing to the recent decline. The evidence presented in Phase I and new information gathered more recently support the 4 reasons (food supply, losses in diversions, toxics and egg supply) identified by the Striped Bass Workshop in 1982. Incidently, substantial new evidence gathered since Phase I, indicates that all 4 are problems, but we believe it indicates that losses in diversions is probably the biggest problem. Within the last few years, however, drastic changes in food supply have occurred, apparently as a result of accidental introductions of new species in ship ballast water. Their effect on fish remains to be determined but we fear substantial harm.

d) Salinity objectives - We are aware of no evidence which justifies the conclusion stated on page 5-91 that the continuing decline of bass indicates that the present salinity standards for bass spawning are inadequate, although the report correctly characterizes the present standards as providing minimal rather than optimal protection. We believe the principal weakness in the present standards pertains to the export limit and flow standards rather than to the salinity standards.

e) Antioch spawning standard - We believe there are valid questions about the adequacy of striped bass standards particularly in dry and critical years, but we believe those inadequacies are better addressed by reviewing the flow standards than the Antioch spawning criterion. We should point out that we are apparently entering the fourth consecutive drought year, but the relaxation provision in the Antioch standard has yet to be invoked.

The salinity standards were designed only to protect spawning during the early part of the spawning period. Protection after May 5 was expected from the Delta outflow standards for bass. We continue to support that approach.

f) Prisoners Point EC Modification - The Department is anxious to rehabilitate the San Joaquin River by improving flows and quality, particularly during the spring when striped bass are spawning and salmon are migrating downstream. The alternative bass spawning standards described in the draft would contribute to that rehabilitation, but with the present physical configuration of the Delta and export limits we are not confident that they would significantly improve bass production because most of the eggs and larvae produced would probably be exported by the CVP and SWP. We have

been unable to get estimates of the flows likely to be required to meet the alternative salinity standards, but we suspect we could justify the flows better for their value in enhancing salmon survival than their value in increasing spawning habitiat for bass. During the Water Rights Phase of these proceedings we hope the Board will be willing to address facility and operational changes to protect bass spawning in the San Joaquin River. The benefits of modifying the Prisoner's Point standard should be reconsidered then.

American Shad - We do not have evidence to support a temperature standard for shad in the Delta, and are confident that shad production is affected more by flow. Hence we do not endorse the alternative presented in the draft plan.

Delta Smelt - Delta smelt have obviously become an important issue, but we are just starting the analysis required to respond to the Fish and Game Commission's acceptance of the species as a candidate under the endangered species act. That analysis will be available for public review this summer and we will present our findings to you for your consideration.

Suisun Marsh

a) The draft incorrectly characterizes the Biological Assessment made in 1981 as focusing on direct impacts of physical structures on the salt marsh harvest mouse and clapper rail. The Assessment considered potential habitat changes throughout the Marsh and resulted in what is essentially a habitat protection plan for the mouse throughout the Marsh.

   We, however, concur with the basic thrust of the staff analysis that a new biological assessment is needed to deal with today's larger list of protected species. We are committed to involving the groups which testified on the subject during Phase I in the evaluation and have had preliminary discussions with them.

b) We are concerned that the draft plan appears to imply that changes in standards for Suisun Marsh are the only change warranting consideration of effects on endangered species. We believe the plan as a whole warrants consultation pursuant to state and federal endangered species laws.

c) We believe this plan should reiterate the fact that the Board explicitly concluded in D1485 that reliance solely on freshwater outflow to protect the Marsh was not reasonable pursuant to the California Constitution. While we don't consider that to be an irrevocable conclusion, its restatement is important to keeping the

issue in perspective. Clearly, our Department would prefer to protect the Marsh through outflow, but over 20 years of struggling with the issue has convinced us that is not realistic.

d) We are concerned about the effects of a new water year classification on Marsh protection. Our preliminary assessment is that the new classification might have caused as many as 3 additional deficiency years in the Marsh during this historical period. We will review this in more depth and provide a recommendation.

Export Area Fishing

We object to the characterization of the striped bass fishery in the export system (p 5-90). It is inappropriate, to characterize striped bass or other export system fish populations as part of the estuarine populations and to consider the striped bass population estimates we presented in Phase I to be underestimates, as the draft report does. Striped bass in the export system clearly do not help support the estuarine population, to the contrary, we believe the evidence indicates that increasing diversions of bass into the export system could cause the demise of the estuarine population. In the event of such a demise, the export system population would also collapse due to the lack of new recruitment from the estuary.

We do recognize, however, that the fishery, including striped bass, in CVP and SWP reservoirs and canals provides a substantial benefit to the people of the state. That was recognized during project planning and helped justify some enhancement benefits for both projects. The Department of Fish and Game will continue to manage fisheries in those systems to maximize benefits.

Flow and Operational Objectives

Your 1978 Water Quality plan includes various flow and operational objectives for the protection of fish and wildlife. We assume that their absence in the current draft reflects your change in policy and intent to delete them. We recommend that the plan state that decision explicitly and describe both the rationale supporting the decision and the approach you are going to follow in addressing flows for the protection of fishery resources.

U.S. FISH AND WILDLIFE SERVICE COMMENTS ON THE PARTIAL DRAFT WATER QUALITY CONTROL PLAN FOR SALINITY IN THE BAY-DELTA ESTUARY DATED JANUARY 19, 1990

We appreciate the opportunity to comment on chapter two through five of the partial draft Plan, to present our preferred set of objectives, and to address the issues listed in Attachment A of the public workshop scheduled to begin February 20, 1990. The Service also is providing three reports that present results of salmon research conducted since our 1987 Phase I testimony. These reports include work on the effects of water temperature and other factors on juvenile salmon survival.

We will provide additional comments on other aspects of the Water Quality Plan (Program of Implementation, review of Appendices, Monitoring, Special Studies, etc.) in further workshops and the Water Quality Hearing on the Plan itself.

Our comments at this workshop are restricted to those dealing with fish and wildlife issues. We desire to see the best combination of measures and balancing to protect the fisheries and wildlife of the Bay-Delta. While it is apparent that the Board believes a Water Quality Phase which excludes the use of flow, export, and operational objectives is necessary, we have found the process difficult. The Service looks forward to completion of the Water Quality phase and initiation of the Scoping Phase where a total management approach will be possible.

An oral summary of this written statement will be presented to the State Water Resources Control Board by Dr. Martin A. Kjelson, U.S. Fish and Wildlife Service, at one of the workshop dates between February 20 and 27, 1990.

REPORTS OF WORKGROUPS

The following three reports represent work done under the guidance of the Interagency Ecological Study Program for the Bay-Delta Estuary, the Five Agency Salmon Management Evaluation Group, and the Services' Stockton Fisheries Assistance Office.

- WQCP-USFWS-1 - 1989. Kjelson, M., Greene, S., Brandes, P. A Model for Estimating Mortality Survival of Fall-run Chinook Salmon Smolts in the Sacramento River Delta between Sacramento and Chipps Island. 50 pp.

- WQCP-USFWS-2 - 1989. U.S. Fish and Wildlife Service. Survival and Productivity of Juvenile Salmon in the Sacramento-San Joaquin Estuary. Annual Progress Report, Stockton, Ca. Fisheries Assistance Office. 59 pp.

- WQCP-USFWS-3 - 1988. U.S. Fish and Wildlife Service. Determine Survival and Productivity of Juvenile Chinook salmon in the Sacramento-San Joaquin Estuary. Annual Progress Report, Stockton, CA Fisheries Assistance Office. 60 pp.

Some of these results were presented at a Public Trust workgroup meeting held during the summer of 1989. These reports, although given a broad distribution already, are offered to update and supplement our previous testimony on salmon. The two annual reports have received some peer review but less than that given to the smolt survival model report. These three reports reflect our findings to date and hopefully will be useful to the Board and its staff, but are not to be considered final relative to either the Scoping or Water Rights phases of the Proceedings. A report describing the benefits and costs of both operational and structural measures for improved salmon protection in the Delta as part of the Five Agency Salmon Evaluation will be provided to the Board for the Scoping and Water Rights Phases.

COMMENTS ON ISSUES - ATTACHMENT A LISTINGS

Temperature Effects on Fish

1. The Service advocates a decrease in water temperature to protect Delta Salmon if it can be effected with a net benefit to fish. Evaluation of potential measures to influence water temperature is a part of the Fish Agency Salmon Evaluation effort. We also are assessing ways to increase salmon migration rates through the Delta to lessen exposure time to high temperatures or to encourage earlier migration when temperatures are lower.

2. Based on recent temperature modelling by Bureau of Reclamation staff, it does not appear possible to measurably decrease water temperatures in the Delta through operational measures. Documentation and peer review of the Bureau temperature model is an important need to assure this conclusion is correct. The use of large volumes of flow via reservoir releases in the spring to attempt to lower Delta water temperatures would most likely lessen the possibility of controlling upstream water temperatures important for salmon spawning incubation and rearing in the late summer and fall. As part of the Five Agency Salmon evaluations, we are working with the Department of Water Resources Operations Modelling staff to evaluate the use of water for salmon in the spring for Delta migration and in the late summer-early fall for upriver spawning and incubation.

3. Based on our studies, the Service believes that water temperatures in the high 60's°F or greater are very adverse to migrating smolts. This justifies an objective in the mid 60's°F but means of attaining such an objective does not appear possible given present knowledge. Hence, if an objective is set (say 68°F as in the Central Valley Basin Plan), it should be within the context that required actions are those that are taken to alleviate controllable factors that cause temperatures to rise above that point. The salmon temperature alternative we have suggested is written in that context.

4. The Board and its staff are directed to the three reports provided by the Service to gain further understanding of the influence of water temperature on salmon survival in the Delta. We understand that other participants of the Five Agency Salmon Management Evaluation group may provide additional information to the Board on the salmon/temperature issue.

5. The Service suggests that historical Delta water temperature records be developed or temperature modelling be done to quantify the potential changes that may have occurred to water temperature in the Delta prior to major water project development. This analysis would put in perspective the degree of change in water temperature that may have occurred and provide a means to quantify the actual impact of such temperature changes on smolt survival using our smolt survival model. It seems important to define just how great a change in temperature, if any, may have

occurred. Ultimately, a temperature model for the San Joaquin Basin will be desirable.

6. The Service desires to emphasize that, while a great deal of interest has been shown to the effect of water temperature on juvenile salmon using the Delta and apparent difficulty in controlling temperature, there are several other key factors than <u>can</u> be controlled that could improve salmon survival in the Estuary. These include: the fraction of water diverted off the Sacramento and San Joaquin Rivers, export levels, unscreened diversions, reverse flows, and the magnitude of river flow and Delta outflow.

7. As a means to exemplify the potential smolt survival benefits of decreases in 1) water temperature, 2) the fraction of water diverted at Walnut Grove via the Delta cross-channel and Georgiana Slough and 3) total CVP/SWP exports in the south Delta, we have provided three tables of smolt survival indices for varied temperature, diversion and export conditions based on our smolt survival model. The zero percent diverted could, for example, reflect a 100% efficient fish screen on the two Walnut Grove diversion channels. The indices represent predictions of relative survival levels for smolts migrating between Sacramento and Chipps Island and is based on our smolt survival model. While specific values of the survival index are given, it is appropriate to consider only the general trends and the relative magnitude of change in survival as conditions change, rather than the absolute values.

Survival indices for salmon smolts migrating through the Sacramento River Delta under varied water temperatures, percents diverted at Walnut Grove and CVP/SWP export rates.

Exports = 2000 cfs

	Temperature (°F)					
Percent diverted	60	62	64	66	68	70
0%	.64	.51	.40	.30	.22	.15
30%	.57	.46	.36	.27	.20	.14
70%	.47	.39	.30	.23	.18	.12

Exports = 6,000 cfs

	Temperature (°F)					
Percent diverted	60	62	64	66	68	70
0%	.64	.51	.40	.30	.22	.15
30%	.52	.41	.32	.24	.17	.11
70%	.36	.28	.21	.16	.11	.07

Exports = 10,000 cfs

	Temperature (°F)					
Percent diverted	60	62	64	66	68	70
0%	.64	.51	.40	.30	.22	.15
30%	.47	.37	.28	.21	.15	.10
70%	.25	.18	.13	.09	.07	.04

Modification of Prisoners Point and Antioch Salinity Objective

1. The Service believes it is appropriate to modify the Prisoner's Point Salinity objective to permit striped bass to spawn further upstream in the San Joaquin system. To their great detriment, under present export magnitudes and schedules young bass and eggs are very vulnerable to the south Delta exports. Thus modifying this objective would not likely help bass production at this time. We hope, however, the current operational scheme will be greatly modified via the Scoping Process and Water Rights Decision to eliminate the adverse effects to striped bass and other fishes exposed to the diversions. Hence, if we are to assume a combination of water quality and water rights actions are to be used to improve protection of the bass resource, it seems proper to modify this water quality objective at this time. We acknowledge that the benefits of a broader spawning area is difficult to quantify, even without south Delta exports. However, given the poor condition of the bass population, the Service believes any potential habitat improvement to bass production should be aggressively pursued.

2. The lowering of salinity in the San Joaquin River Delta will require increased flows from the San Joaquin basin and through the south, central and western Delta. Such changes have the potential to not only beneficially affect striped bass production but also that of chinook salmon and other species. Again, the Service believes the Board must evaluate the variety of measures and combinations thereof to achieve a total system management plan if the proceedings are to achieve reasonable protection for all beneficial uses.

3. Due to the minimum protection provided for bass spawning and the recent evidence that indicates low egg supplies have contributed to their decline, the Service believes better spawning conditions should be provided. The proposed objectives are again given in the context that to attain such objectives will likely require a combination of water quality and water rights actions.

Additional Study Needs for Rare, Threatened and Endangered Species

1. The statement of the issue in Attachment A to the Workshop Notice is confusing. It is our opinion that perhaps the workshop responses would have

been more helpful had the issue statement made no reference whatsoever to the Suisun Marsh Preservation Agreement. The Service will make detailed comments regarding these issues relative to the Federal Endangered Species Act at subsequent hearings and on receipt of the complete draft Water Quality Control Plan.

Retention of Dissolved Oxygen Objective

1. The Service believes that the dissolved oxygen objective should be retained. Preferably this should be achieved through flow increases if they found to provide overall net benefit to the fishery.

CHOICE OF ALTERNATIVE OBJECTIVES

The Service believes the following water quality objectives(from Attachment D, Table 6-1) are appropriate for the protection of selected fishery resources in the Bay-Delta. See full description in Table 6-1.

Objective	USFWS Alternative Choice
Chinook Salmon - Dissolved Oxygen	(USFWS advocated) Minimum dissolved oxygen of 6.0 mg/l between Sept 1 - Nov 30 for all year types between Turner Cut and Stockton on the San Joaquin River.
Chinook Salmon - Temperature	When temperature increases are controllable, they shall be limited to a maximum 7 day surface temperature of 66°F at Vernalis on the San Joaquin River and Freeport on the Sacramento River. Other locations further downstream (e.g. Isleton and Jersey Point) may also be required sites for this temperature objective. The target temperature shall not be exceeded for the period May 1 to May 31 in Dry

		and Critical Dry years, and May 1 to June 15 in Wet, Above Normal, and Below Normal years.
Striped Bass -	Salinity: 1 Antioch spawning	(Staff Analysis - 1B modified)
-	Salinity: 2 Antioch spawning - Relaxation Provision	(Staff Analysis - 2C modified)
-	Salinity: 3 Prisoner's Point spawning	(Staff Analysis - 3C modified)

Note:
Salinity: 1 - 1B Modified - period for wet, above normal, below normal water years should be changed to April 1 to May 31 (in lieu of June 15) since we do not believe significant spawning occurs in June.

Salinity 2 - 2C Modified - Change the period April 1 to May 31 (in lieu of June 15) again since little spawning probably occurs in June.

Salinity 3 - 3C - Modified - Change the period April 1 to May 31 (in lieu of June 15) in wet, above normal, and below normal water years for same reason given above.

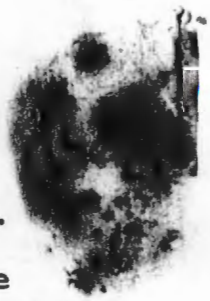
ECONOMIC IMPACTS OF ALTERNATIVE OBJECTIVES

The Service has negligible expertise locally on matters of economic impact analysis and valuations of uses. Therefore, our comment is simply that where economic analyses are utilized, full and complete analyses be performed and appropriate valuations be utilized. The economic impacts to chinook salmon, striped bass and perhaps a few other species will not be indicative of the full economic impact to the fishery. There are many other values that we are sure the economists will find "intangible". Somehow these intangible values have to be factored into the impact assessment. In addition, the valuations of the resources or uses made thereof must be realistic. We believe that the investigators will find a wide range of valuations for various resources and uses. We suggest that if there is any doubt as to the validity of a value, the higher value be adopted to compensate somewhat for the inherent inability to fully quantify all the resource values.

SPECIFIC COMMENTS ON DRAFT PLAN CHAPTERS TWO THROUGH FIVE

Following are just a few comments on the draft chapters two through five. We will comment formally and completely on the complete draft Water Quality Control Plan.

Page	Comment
2-4, Par. 3	Will operational studies combined with the USBR temperature model be used to measure the reasonableness of temperature objectives?
4-24	Table 4-5 - It infers smolts aren't migrating in upstream waters - They are! It infers smolts are fine at less than 68 degrees F, optimum temperature is lower.
5-52, last sent.	Coded wire tag salmon survival data for San Francisco Bay was presented in USFWS Exhibit 31. Also, see updates in USFWS 1988, 1989 Annual Reports provided at this workshop (WQCP-USFWS-2 and WQCP-USFWS-3).
5-55, Par. 2	Add: to (3)... and Georgiana Slough Add: and (5) and diversions into Upper Old River in the San Joaquin River Delta.
5-57, last Par.	The USFWS also recommended that salmon not be diverted off the Sacramento River at Walnut Grove and off the San Joaquin River at its junction with upper Old River.
5-60, Par. 2	Typo - watershed?
5-61, Par. 1	The term "significant decrease" must be defined.
5-61, last Par.	There is some question if the Sacramento River has really been warmer since 1978. This paragraph infers temperature in the San Joaquin is cooler and no problem. In fact the San Joaquin Delta warms sooner and is often about 70 degrees F in early May. Hence, water temperature is a major problem for smolts coming out of the San Joaquin and appears in part related to the very low spring flows in most years in that system.



5-61 I assume we will see all the draft Plan appendices later, i.e. Appendix 5 - salmon.

5-69 A temperature model would be useful for the San Joaquin System.

COMMENTS OF DEPARTMENT OF FISH AND GAME ON THE "WATER QUALITY CONTROL PLAN FOR SALINITY, SAN FRANCISCO BAY SACRAMENTO-SAN JOAQUIN DELTA ESTUARY"1/

BROAD POLICY IMPLICATIONS

The draft plan includes a number of statements with broad policy implications. We particularly wish to emphasize the following:

1. The Board forthrightly recognizes the basic water issue facing all Californians by stating:
   "The evidence shows a greater need for water than the available supply." (p 1-5)

2. The Board makes a very important policy statement concerning inequities in the protection of various beneficial uses by saying:
   "The State Board believes that biological resources have declined and are not experiencing the same degree of protection as other beneficial uses. Current water quality objectives have not produced the desired levels of protection for biological resources. Further, intensive measures are needed." (p 1-5)

3. Third, the Board goes on to describe and endorse a general water ethic:
   "All Californians must practice conservation, reclamation and reasonable conjunctive surface and ground water use in order to share responsibilities in the use of water."

The Department of Fish and Game commends you for identifying these principles and will support your efforts to regulate water based on them. While some improvements in these statements are justified based on comments received from various parties, the basic thrust of the statements is valid and should remain in your final plan. To be specific, the Board has received substantial evidence that increases in minimum flows are necessary to protect fishery resources fully. The competition between such needs and the identified export needs justifies a conclusion that an absolute shortage in supply exists--not just in developed supply. Given that shortage everything reasonable needs to be done to

1/ Presented to the State Water Resources Control Board on behalf of the Department of Fish and Game by Harold Chadwick, Program Manager, Bay-Delta Program.

better use existing supplies. While we continue to see a need for facilities to solve some problems, water is also part of the solution.

We think there can be no serious quarrel with your statement regarding inequities in protection of beneficial uses, and it is not reasonable to read your statement as inferring that all deficiencies in protection pertain to biological resources.

The Board goes on to adopt 5 principles to guide development of water quality objectives. Those concerning aquatic life and dilution of pollutants are of direct concern to our Department. We endorse the principle concerning pollutants but have a concern over the aquatic life principle. That principle states an intent to "adequately protect this resource". Taken by itself, that principle could lead to appropriate protection of aquatic life, but it implies a lower level of protection than would be afforded Delta agriculture. The principle concerning agriculture states an intent to "fully protect".

Therefore, to provide equity with other beneficial uses, we recommend the following principle for aquatic resources:

> "Aquatic life in the Estuary should receive salinity and temperature levels that provide full protection, including fully offsetting all identifiable impacts of water projects."

We believe that such a principle is reasonable and does not conflict with your responsibility to balance among beneficial uses. Section 13000 of the Water Code charges you with regulating waters "to attain the highest water quality which is reasonable, considering all demands..." The Racanelli decision cites that section in pointing out the broad discretion the Board has.

Sections 12201-12204 of the Water Code provide specific direction for the decisions the Board is making in these proceedings as follows:

> "12201. The Legislature finds that the maintenance of an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta area as set forth in Section 12220, Chapter 2, of this part, and to provide a common source of fresh water for export areas of water deficiency is necessary to the peace, health, safety and welfare of the people of the State, except that delivery of such water shall be subject to provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code."
>
> "12202. Among the functions to be provided by the State Water Resources Development System, in cooperation with the activities of the United States in providing salinity control for the Delta through operation of the Federal Central Valley Project, <u>shall be the provision of salinity control and an adequate water supply for the users</u>

of water in the Sacramento-San Joaquin Delta. . ." (Emphasis added.)

"12203. It is hereby declared to be the policy of the State that no person, corporation or public or private agency or the State or the United States should divert water from the channels of the Sacramento-San Joaquin Delta to which the users within the Delta are entitled."

"12204. In determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements of Sections 12202 and 12203 of this chapter." (Emphasis added.)

Fish and wildlife are clearly essential to recreational development of the Delta, so these sections support the principle concerning aquatic life which we advocate.

The Board's public trust duty with respect to providing for protection of aquatic resources is set forth in the Racanelli decision by quoting with approval from National Audubon Society vs. Superior Court (Mono Lake case) 33 Cal.3d 419 as follows:

"The state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible...As a matter of practical necessity the state may have to approve appropriations despite foreseeable harm to public trust uses. In so doing, however, the state must bear in mind its duty as trustee to consider the effect of the taking on the public trust [citation], and to preserve, so far as consistent with the public interest, the uses protected by the trust." (national Audubon Society vs. Superior court, Supra, 33 Cal.3d at pp. 446-447; italics added.) The Board's action reflects complete symmetry with these requirements.

More recently the Cal Trout cases impose an even greater affirmative responsibility on the Board to protect fishery resources based on Public Trust and Section 5937 of the Fish and Game Code.

In carrying out its responsibilities, the Board needs to consider not only its discretion and affirmative responsibilities spelled out in the law, but the factual nature of measures available to protect instream uses and consumptive uses. A fundamental difference exists in that, taken as a whole, fishery resources can be protected and maintained only by maintaining adequate instream habitat conditions. In contrast, any specific consumptive use can be met by a variety of measures.

In summary, the Board's principle concerning aquatic resources and our alternative carry out the affirmative duty of the Board and in no way violates the precepts of the Racanelli decision, nor the Mono Lake case, nor the Cal Trout case, nor Section 12201-12204 and 13000 of the Water Code. We recommend

that you accept our alternative principle concerning aquatic life.

As everyone participating in these proceedings knows, the principal actions the Board needs to take to protect aquatic resources pertain to minimum flows and other aspects of water project construction and operations. As we understand it, the Board has concluded that such measures should not be based on authority in the Porter-Cologne Act and the Federal Clean Water Act. Rather, the Board intends to deal with such measures in subsequent water rights proceedings and not in the current proceedings concerning water quality.

We have previously stated our reservations about this approach. We are prepared, however, to participate in the completion of these proceedings and move on to the water rights proceedings as quickly as possible.

In order to clarify your process, you should state early in the report, your policy interpretation concerning the scope of the Porter-Cologne Act and the Federal Clean Water Act more clearly as the basis for not dealing with flow and related water project issues in these water quality proceedings. That description should provide a clear understanding of what will be addressed in these proceedings and the water rights hearing and describe how the results of the two proceedings will be integrated to protect fish and wildlife.

Incidentally, we assume your intent is to have the new water quality plan supersede the 1978 plan, so the flow objectives in the 1978 plan will disappear. We did not see any explicit statement to that effect.

CLASSIFICATION OF WATER YEARS

We endorse the water year classification for the Sacramento River illustrated in Figure 3-4. We believe it represents the available water supply better than the system used in the 1978 plan and view that as the principal criterion to be used in selecting a classification system.

As the draft report points out, the new classification shifts the average classification towards a drier condition. We believe the appropriate response to such changes in frequency of drier years is to improve estuarine protection criteria in drier years to compensate for the increased frequency.

We urge you to proceed with your plans to develop a similar classification system for the San Joaquin System.

Moving forward with plans to develop a sliding scale for determining year types as illustrated in Figure 3-6 is also very important. The very large differences in water quality objectives associated with small differences in water supply at diversions in the classification system are not in the interest of either protecting the estuary's resources or managing water supply.

BENEFICIAL USES

We generally found the description of fish and wildlife beneficial uses in Chapter 4 and the background material on those uses in Chapter 5 to be satisfactory. We however wish to enter into the record new information to be used in making the final report a more accurate description of current knowledge.

The first exhibit for that purpose is a recent compilation of our knowledge of sturgeon (WQCP-DFG-1). We presented little on sturgeon during Phase I, because we had little to offer applicable to these proceedings. As a result the background material included in your draft report does not reflect current knowledge well. We recommend that your staff extract additional information as appropriate and include it in the final report.

We wish to call the Board's attention to two pieces of information in the report. One is that sturgeon were as abundant in the middle 1980s as they have been at anytime in the last 40 years, The second is that the success of sturgeon spawning is greatest in years when river flows are high. We are currently evaluating analyses which appear to provide better evidence on the role of flow, but we will leave that whole subject for further development during the water rights phase.

The second exhibit (WQCP-DFG-2) updates the information in Table 25 of DFG Exhibit 25 by providing the index of young bass abundance in the four years since Phase I. The index of abundance in each of the last three years has been lower than in any previous year. That merely serves to document the continuing poor production of young bass, which is common knowledge among hearing participants.

Obviously, the question of primary interest is the cause of the poor production. The draft report summarizes most of the available information on the subject and expresses the Board's frustration on the status of knowledge. The draft report continues to list the problems included in the Department's "Striped Bass Restoration and Management Plan for the Sacramento-San Joaquin Estuary." Listing those problems is reasonable but they need to be placed in the proper context. Less than half play a significant role in issues before the Board in these proceedings. The most important of these problems should be emphasized.

To provide you with evidence close to our own latest thinking on the issues before the Board we are presenting a third exhibit (WQCP-DFG-3) entitled "Where Have California's Striped Bass Gone?" This report has been widely circulated as a draft among the scientists investigating the striped bass problem. The basic premises in that report have not been refuted. We believe your final plan should incorporate its findings.

The report reexamines the four hypotheses for the cause of the bass decline which were first identified by DFG staff in 1980 and evaluated by the Board's work group almost 10 years ago. The report identifies a relationship between young bass survival, May-June Delta outflows, and May-June water exports. That

relationship is consistent over the period of record, and is consistent with a hypothesis that the cumulative effects of losses in water diversions and responses to changes in Delta outflows are the primary controlling factors. The survival relationships are not consistent with hypotheses that food supply or toxicity are the primary factors that caused the bass decline. If that were the case, survival would presumably have declined at any given outflow. In saying this, we are not concluding that toxicity and food do not affect bass survival. Evaluation of both should continue and appropriate steps should be taken to correct identified problems.

The report also presents an analysis indicating that the abundance of spawners and their egg production is determined largely by the production of young bass 5 to 8 years earlier and the subsequent losses of those young bass in SWP-CVP exports.

Overall then, the report presents additional evidence that improving outflow and reducing losses of young bass in diversions is necessary to increase the production of young bass. We will continue to work with all parties to refine that evidence and present it during the water rights proceedings. Meanwhile, your current report should reflect our latest report so it includes the most up to date information on the subject.

Even if those analyses turn out to be the best information on historical changes, we all need to keep in mind the recent dramatic changes in food organisms caused by accidental introductions of invertebrates. Those changes may be placing additional stress on bass.

One last background item is that our report on Delta smelt has been submitted to the Fish and Game Commission. Our analysis identified no additional issues pertinent to your Water Quality Plan, but your staff may want to use it in updating information in your draft plan.

WATER QUALITY OBJECTIVES
Fishery Habitat Protection (Entrapment Zone)

We believe consideration of measures to protect habitat in the entrapment zone needs to be integrated with consideration of minimum flows to protect striped bass and other fishes in that area. The factors controlling production at lower levels of the food chain are so interrelated with factors controlling the survival of young fish that such an integrated approach to the two subjects is essential. Since you have deferred consideration of such minimum flows for fish to the Water Rights Phase, we accept your proposal to defer consideration of the entrapment zone.

Chinook Salmon-Temperature

Temperature objectives should be established for the protection of chinook salmon, keeping in mind that in the Estuary the principal need concerns downstream migrant smolts during the spring. Since substantial migration of smolts occurs in April and is essentially completed sometime in June (USFWS, 31), the temperature objective for smolts should start in April and end in June.

As we testified during your earlier hearing on the draft plan, we advocate a temperature objective of 68°F in the spring because that is the temperature designated in your Basin Plan for the Central Valley. Our understanding is that objective was selected several years ago based on an analysis of the literature on salmon by the staff of the Central Valley Regional Water Quality Control Board. That temperature is reasonably consistent with current information being generated by the Interagency Salmon Study, as reported to you by the Fish and Wildlife Service. Undoubtedly, increasing temperatures gradually becomes more stressful, so it is difficult to select a specific temperature objective. We consider 68°F to be higher than the minimum level which causes stress.

Temperature needs for salmon have been identified after the end of downstream smolt migration, but such needs pertain either to areas upstream from the Estuary, or to temperatures different from those associated with smolt survival. The only such temperature information for the Estuary indicates salmon fail to migrate upstream in the San Joaquin Delta in the fall when temperatures exceed 65°F (FWS, Exhibit 31).

We recommend that the Board adopt temperature objectives for salmon as proposed in Table 6-4 except that the time period should be April 1-June 30 rather than May 1-Nov. 1, and a second similarly worded objective be established for 65°F in the San Joaquin River at Vernalis for September, October and November. These recommendations on temperature objectives should be considered in the context of the existing basin plan which includes an objective that temperature "shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses."

The Board has defined "controllable factors" appropriately and further interpretation should be on a case by case basis during implementation.

Chinook Salmon - Dissolved Oxygen

We endorse the dissolved oxygen objective of 6 ppm for salmon in the San Joaquin River as proposed in Table 6-4. If other parties should object to the objective being applicable all year, the Board should recognize that the time period critical for upstream migrant salmon is September through November.

Restricting the improved dissolved oxygen objective to those months would make Table 6-4 consistent with the intent expressed on page 5-36.

Striped Bass

Antioch Water Works Objective - The Department of Fish and Game is modifying its recommendation concerning the salinity objective at the Antioch Water Works to protect striped bass spawning. In your earlier hearing, we urged retention of the same reliance on the combination of EC and flow provided in the 1978 plan. Upon further consideration, however, we have concluded that the decision to eliminate flow objectives during these proceedings would result in an objective at the Antioch Water Works which would not be in compliance with the Federal Clean Water Act because bass would be protected only during half their spawning period. Further, we believe the Board has correctly identified a need for improved protection in drier years.

Accordingly, we endorse striped bass objectives 1 and 2 as presented in Table 6-4.

Basing deficiencies for the bass spawning objective on water year classification rather than on when water users are taking deficiencies would not be equitable. That has become clear recently when water users decided not to take any deficiencies in the first three years of the current drought. While that decision was an understandable gamble on the drought's not being prolonged, its consequence was that only instream uses took all of the deficiencies for several years and this year's crisis was accentuated. It leads us to conclude that in the interest of equity more, not fewer deficiencies for instream objectives should be tied to deficiencies in water deliveries rather than water year classification.

Prisoner's Point Objective

Our Department presented information on striped bass spawning and salinity in the San Joaquin River above the Mokelumne River during previous water rights and water quality hearings. That information led to the Prisoners Point Objective in the 1978 plan. The essential facts are:

1. bass spawn primarily at an EC of less than 0.3 mmhos\cm (TDS=170 mg/l),
2. bass seldom migrate up the San Joaquin River to spawn when the EC exceeds 0.44 mmhos/cm (TDS=250 mg/l), and
3. bass essentially do not migrate upstream past the point where the EC exceeds 0.55 mmhos/cm (TDS=350 mg/l).

Those limits are approximations both because precise determinations can not realistically be expected from field observations and the actual limits are probably not definite.

The crux of the issue is that the San Joaquin River above the Delta is too salty for bass spawning in drier years. In those years, spawning is limited to the reach from just above the mouth of the Mokelumne River to Antioch where Sacramento River water flowing through the Delta Cross Channel and Georgiana Slough freshens the San Joaquin River. The Prisoners Point objective of 0.55 mmhos/cm is designed to prevent further deterioration at the upper end of that reach.

If the objective is to restore spawning in the historical spawning area in the San Joaquin River, the best scientific evidence is that an EC of no more than 0.44 mmhos/cm is needed from April 1 through May 31 upstream from the Mokelumne River. Every indication, however, is that restoration of striped bass depends primarily on management decisions pertaining to areas farther downstream in the Delta and Suisun Bay. The Board will be asked to deal with those issues during the water Rights phase of these proceedings.

Restoration of bass spawning in the San Joaquin River could be a useful adjunct to measures directed towards rehabilitating downstream areas. By itself, however, we believe it would at best provide a small benefit and at worst could be detrimental to bass. Detriment could result from bass eggs and larvae drifting downstream in the San Joaquin River being more vulnerable to diversion at the CVP and SWP export pumps than eggs spawned in the lower San Joaquin River. That concern is emphasized by the results of the operations study done to evaluate the consequences of objectives being considered in the draft plan. That study shows that implementation of objectives to reestablish spawning in the San Joaquin River would result in increased CVP/SWP exports, absent additional operating constraints.

Considering fishery issues in the San Joaquin River as a whole, the primary benefit of rehabilitating the river is restoration of the salmon runs. The evidence presented in Phase I of these proceedings demonstrates that salmon restoration requires major increases in flow, primarily during the spring. We would expect salmon restoration to restore the river for striped bass spawning and very likely for shad and sturgeon also. Without doubt, not only the primary benefit but also the best technical case is based on salmon. Accordingly, we recommend that you adopt Objective 3-b (p5-57) for striped bass but delay consideration of implementation to the water rights hearing when it can be coordinated with other measures for striped bass and salmon.

Other Fisheries

Given your decision to eliminate objectives for flow and water project operations from the Water Quality Plan, we concur with conclusions in the draft plan indicating that other fishery

objectives should be dealt with in the water rights hearing. We must say, however, that while you clearly state an intent to do that on page 2-2 and 7-3, many people reading the plan report a perception of mixed messages on flow issues. More clearly stating your policy decision about removing flow objectives from the water quality proceeding, as suggested earlier in this statement, could help alleviate that perception.

Suisun Marsh

We concur with adoption of objectives for Suisun Marsh as described in Table 6-4. The Board's intent as to when these objectives would go into effect is not described in Chapter 6. Since the Board has determined that the Suisun Marsh Preservation Agreement (SMPA) adequately protects the managed wetlands (page 6-68), we assume that the objectives are to become effective as provided for in that SMPA. In that regard, Table 5-6 is not consistent with the SMPA. The SMPA keys implementation to the date when "the Montezuma Slough Control Structures Becomes Operational." Since it officially became operational in November 1989, the dates in Table 5-6 need to be changed as provided for in the SMPA.

The issue is further complicated by the fact that Article 3(a) of the SMPA permits Fish and Game and Suisun Resources Conservation District to delay the Normal Standards and leave the Initial Standards in effect. To date, we have done that and probably will continue to do so until we are confident that the partial Normal Standards which go into effect with Montezuma Slough Control Structure protect the western marsh at least as well as the Initial Standards.

Antidegradation Objectives

The Department considers the concept of antidegradation objectives to be implemented in 1993 a reasonable approach to adopting a Water Quality Plan given uncertainties about effects of the Suisun Marsh standards on nontarget areas. We are prepared to participate in gathering information for the biological assessment needed to resolve those uncertainties.

While we endorse the antidegradation concept and the proposed objectives would satisfy us, there are questions about what constitutes appropriate antidegradation standards. We are willing to listen to a discussion of those questions and consider alternatives.

PROGRAM OF IMPLEMENTATION

The draft plan describes a generally sound program of implementation. The Department specifically endorsed the proposed Statewide Water Management Policies, the concept presented for meeting objectives pertaining to fish and wildlife, the Salt Load Reduction Policy, and compliance monitoring.

A variety of special studies are clearly needed and are an appropriate subject in the Program of Implementation. The discussion of special studies for fish and wildlife in the draft is a useful discussion about studies applicable to water quality objectives and some flow and water project operation issues.

Implementing all of the studies proposed would cost millions of dollars, and we and undoubtedly others have different perceptions of priority. Thus, while it is helpful to include the Board's perception of study needs, the Program of Implementation should adopt a process for selecting and evaluating fish and wildlife studies rather than specific studies. We recommend that the Board commit to working through the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary to establish a formal process for evaluating studies. As you know, the Board participates in that program. Based on decisions at the last meeting of the Directors of the agencies, staff is preparing proposals to strengthen the program, including providing for more extensive peer review and better input from affected parties into the scope of the program. Arrangements could easily be made to brief the Board as a whole, perhaps on an annual basis, on program progress. Such a presentation might serve as the "Aquatic Habitat Status Report" discussed on page 7-29. Based on Interagency recommendations and any other input, the Board should approve and order specific studies . Board approval is important to insure that proposals meet your needs for specific information.

We have not attempted to critically review all of the identified study needs and believe that would be better done through the process recommended above. We do, however, offer the following comments on specific elements proposed in the draft:

1. Two additional special study subjects need to be addressed. One pertains to the flow needs for fish in the San Francisco Bay region. The present San Francisco Bay-Delta Outflow Study needs to be modified in light of the factual information gathered during the past 10 years and continued to focus on specific topics. The interagency group responsible for technical management is preparing recommendations for such changes. Second, additional physiological studies are needed to better define relationships between temperature stress and the survival of salmon smolts.

2. The draft describes a proposal to implement a punchcard management system for monitoring salmon and steelhead fishing. The Department has programs to monitor salmon and steelhead catches and has recently upgraded sampling in inland waters. We believe those programs can provide sufficient information for issues before the Board and urge the Board not to advocate imposing additional regulations on sport fishermen. We continue to feel strongly that the Board should protect habitat

quality for fish regardless of how a fishery is regulated, so regulating fish harvesting is not germane to your proceedings.

3. In light of the fact that we are often accused of studying things forever, we find it somewhat ironic to be told that the Board can not rely on "old data" from studies which were accepted 20 some years ago as providing rather clear cut results on striped bass spawning in the San Joaquin River. We suggest that specific needs on that topic need to be discussed in the Fisheries and Water Quality Committee of the Interagency Program in the context of their management implications and other priorities for information on striped bass.

4. In a somewhat similar vein, there was a truly massive three year evaluation of the effectiveness of Skinner Fish Facility in the early 1970s, and several follow up evaluations of changes made in response to that study and of various specific system components. We do not believe any further general evaluations would materially assist the Board.

   The Tracy Fish Facility presents a somewhat different issue. Several evaluations date back to the 1950s. No truly satisfactory evaluation of the primary system has ever been done, but the facility's design is such that an evaluation comparable to that at the Skinner Facility would be difficult to do. Again, we do not believe further studies are justified for issues before the Board.

5. The annual spring die-off of striped bass is a truly vexing problem and involves the death of thousands of adult bass each year. In 1956, our boat captain, who had then spent almost 40 years on the river, told me the die-off had been happening as long as he could remember. Our Department, the Regional Water Quality Control Board and the U.S. Geological Survey have conducted a number of independent investigations to try to determine the cause or causes. Most recently, we have supported a several year investigation by scientists for the University of California. They found that the livers in dying bass were damaged, apparently from petroleum compounds. We are expecting a final report soon. We would welcome the Board's help in defining and funding efforts to determine the cause.

6. I want to call your attention to the following sentence on page 7-21 concerning the ongoing Article VII negotiations:

"It could be considered counterproductive in the long term for the State Board to arrive at some Water Quality Control Plan and Water Right Decision to protect various beneficial uses in the Estuary, only then to be presented with different proposals and new sets of facilities and operations which may or may not be compatible with protecting the beneficial uses in the new Plan and Decisions."

It would be helpful to know what the true message is that the Board intends to convey by that sentence. It could be interpreted as discouraging negotiations.

Our Department has been very frustrated over the years by the failure to get adequate operating criteria and facilities to protect resources in the estuary from the adverse effects of water development. Obviously we are not alone in that frustration and our frustration does not focus on the Board. Rather, it ranges from an inability to document some resource needs, to resistance to improvement measures by some parties, to the failure of our whole social structure to resolve facility and operational issues pertaining to the Delta and Bay. That failure has occurred despite sincere and diligent efforts by individuals from the whole spectrum of interest groups to resolve issues. We assure you that our current efforts are another sincere attempt to be productive--not counterproductive, and we would welcome any advice Board members have towards that end.

7. Relative to Suisun Marsh, a substantial monitoring program is proposed for managed wetlands on the channel islands in Suisun Bay (p 7-26). We believe that is inappropriate and overlooks the nature of the settlement for these islands. To be specific, Fish and Game and the Fish and Wildlife Service estimated the degradation expected due to water project caused changes on the islands. The Suisun Marsh Mitigation Agreement executed by us, the Department of Water Resources and the Bureau of Reclamation in 1987 provides for the establishment of 454 new acres of wetland within Suisun Marsh to compensate for that degradation. We have purchased the land for half of that acreage and are proceeding with wetland development as quickly as state administrative procedures permit. The remaining acreage is scheduled for development in 1998. Thus, channel island studies should not be included in your final report.

Returning to the last portions of the Program of Implementation, the discussion of beneficial uses includes a

section entitled "Export Recreation and Export Fishery Habitat." We continue to believe the Board is placing undue significance on those subjects. Our Department works with the agencies operating the export system to provide the best possible fishing recreation. We will continue to do that, and we see no need to consider operating criteria for those reservoirs as an element in the Bay-Delta proceedings. As a matter of policy, we are particularly concerned about any implication that reservoir fishing is an extension of estuarine resources. Any consideration of fishing in the export system as offsetting degradation in the estuary is unacceptable to us. While regulation of reservoir levels and other operational measures could improve fishing, that is true for storage reservoirs above the Delta as well as those in the export system. Incorporation of such regulatory measures would enormously complicate the Bay-Delta proceedings. We strongly recommend that you leave such issues to be dealt with directly by our managers and the operating agencies.

The Implementation Section concludes with a section describing the difficulty the Board has in requiring existing water rights holders to initiate new monitoring programs. We endorse the concept of the legislation you propose to remedy that problem. It would certainly seem consistent with the direction given in the Racanelli Decision to consider all upstream water rights holders in determining responsibility for protecting beneficial uses in the Estuary.

SUMMARY

Thank you for the opportunity to appear before you to present the Department of Fish and Game's views on your draft Water Quality Plan. We applaud the general policy direction for California water management included in the draft. While we continue to have reservations about removing flow issues from these Water Quality proceedings, we understand your reasons for doing so. With some modifications as indicated, we endorse the water quality objectives you propose to adopt to protect fish and wildlife. We also endorse much of your proposed Program of Implementation. We do, however, recommend that you adopt a process for evaluating and selecting special studies rather than incorporating a definitive set of such studies in the plan. We believe that you could accomplish that review effectively through the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary, with subsequent Board approval.

HEARING PROCESS
SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY

NOTICE OF INTENT TO APPEAR

PARTICIPANT United States Fish and Wildlife Service PAGE 1 OF 1

PHASE	DATE	NAME OF WITNESS	SUBJECT OF PROPOSED TESTIMONY	EST. LENGTH OF DIRECT TESTIMONY	EXPERT WITNESS (YES/NO)*	COST OF TESTIMONY SUMMARY	NO. OF SUMMARIES WANTED **
WQCP	3/11/91	Wayne S. White	Summary of U.S. Fish and Wildlife Service comments on the January 1991 Final Draft Water Quality Control Plan for Salinity (submitted as WQCP-USFWS-7)	10 mins.	Yes	None	
		Other Service experts to be available for cross-examination include Dr. Martin Kjelson and Richard Morat (Qualification statements					
		of each are already in the record).					

(if more space is required, please add additional pages)

* FOR EACH PERSON TESTIFYING AS AN EXPERT WITNESS, PLEASE ATTACH A STATEMENT OF HIS/HER QUALIFICATIONS. ASSIGN AN EXHIBIT NUMBER TO EACH STATEMENT OF QUALIFICATIONS SUBMITTED.

** RESERVED FOR PARTIES REQUESTING COPIES OF TESTIMONY SUMMARIES.

SEND REQUESTS FOR COPIES OF TESTIMONY SUMMARIES AND REMITTANCE TO:
(NAME, TELEPHONE NO. AND ADDRESS OF PARTICIPANT'S REPRESENTATIVE)

Richard Morat
U.S. Fish and Wildlife Service
2800 Cottage Way, Room E-1803
Sacramento, CA 95825
(916) 978-4613

Attachment A

HEARING PROCESS
SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY

INDEX OF EXHIBITS

PARTICIPANT United States Fish and Wildlife Service

PHASE	DATE	EXHIBIT NUMBER	NAME OF AUTHOR OR PREPARER OF EXHIBIT AND DESCRIPTIVE TITLE OR CLEAR EXPLANATION OF THE CONTENTS OF EACH EXHIBIT (USE MORE THAN ONE LINE PER EXHIBIT AS NEEDED)	WITNESS TO USING THIS EXHIBIT	REFERENCED (YES/NO)	COST	NO. OF COPIES WANTED*
WQCP	3/11/91	WQCP USFWS-7	U.S. Fish and Wildlife Service comments on January 1991 Final Draft Water Quality Control Plan for Salinity 8 pp	White	No	None	
WQCP	3/11/91	WQCP USFWS-8	Qualification Statement - Wayne S. White		No	None	

(if more space is required, please ad additional pages)

* RESERVED FOR PARTIES REQUESTING COPIES OF EXHIBITS.

SEND REQUESTS FOR COPIES OF EXHIBITS AND REMITTANCE TO:

Richard Morat
U.S. Fish and Wildlife Service
2800 Cottage Way, Room E-2753
Sacramento, CA 95825
(916) 978-4613

Attachment B

U.S. FISH AND WILDLIFE SERVICE COMMENTS ON FINAL DRAFT WATER QUALITY CONTROL PLAN FOR SALINITY SAN FRANCISCO BAY/SACRAMENTO SAN JOAQUIN DELTA ESTUARY JANUARY 1991

An oral summary of this written statement will be presented to the State of California, Water Resources Control Board by Wayne White, Field Supervisor at the March 11 and 12, 1991 hearings. Specific comments will be presented in written form only as part of this exhibit.

WQCP-USFWS-7

Mr. Chairman, and members of the Board, we are here to comment on the January 1991 Final Draft Water Quality Control Plan for Salinity. I will orally present our brief general comments. An essentially verbatim version of my oral summary and our specific comments is being submitted as WQCP-USFWS-7.

The Fish and Wildlife Service (Service) testified in August 1990 on the June 1990 Revised Draft Plan. Our comments were identified as WQCP-USFWS-5. Those comments are largely applicable to this January 1991 Final Draft Plan. At the present time we will comment on some of the changes in the January 1991 Final Draft relative to the June 1990 Revised Draft as well as reiterating some of our continuing concerns.

The following are our major concerns:

- Removal of previously stated commitments to protect the aquatic environment.

- Potential impacts of implementing the proposed Sacramento Basin water year classification system on fish and wildlife resources.

- Board reliance on negotiated agreements.

- Adequate protection for Delta smelt.

- Lack of quantification of fishery protection levels and the impacts of the alternatives.

- Unaddressed needs for protection of fish and wildlife resources outside the scope of the Suisun Marsh Preservation Agreement.

- Continuing emphasis upon the assumption that "we don't know enough about fish to make a decision".

- Consideration given to both habitat quality and quantity measures should be commensurate with consideration given to structural measures.

The June 1990 Revised Draft Plan stated many strong commitments to protecting the aquatic environment which we applauded in Exhibit WQCP-USFWS-5. These have in large part been removed and we in turn are concerned about the balancing process and criteria which, in WQCP-USFWS-5, we asked be explained.

Use of the proposed Sacramento Basin water year classification system may be appropriate. We previously noted a possibly greater frequency of "dry year" occurrences with the proposed classification system. If there are ultimately adverse impacts to fish and wildlife resources from use of this system, they should be clearly identified and mitigated. If not mitigated, the use of this classification system would result in reduced protection for fish and wildlife.

The Final Draft Plan indicates that the Board will rely heavily on negotiated agreements to solve the dilemma of balancing the protection of beneficial uses. We question what happens if negotiated agreements fail to be realized or are negotiated only to a few minority views. We envision that the Board will get a lot of dissenting views. We realize that, in spite of negotiated agreements, the Board need not have consensus nor agreement in their adoption of a plan, only that they balance the protection of beneficial uses.

The Delta smelt is a candidate for listing under the Endangered Species Act. We have been petitioned to list it and it may be listed prior to completion of the Bay-Delta Proceedings. There is a lot we do not know about what is affecting the species however. The range and salinity requirements for spawning are a major concern with respect to the standard-setting process. The Final Draft Plan salinity objectives may not provide a sufficient level of protection for Delta smelt spawning and nursery needs. We draw your special attention to our specific comment regarding Delta smelt.

Where relationships are not precisely understood, there is a tendency to describe impacts in qualitative rather than quantitative terms even though quantitative data are available or possible. To overcome this weakness in the Final Draft Plan, we make specific comments on the need to display quantitative data (e.g., salmon) to support the decisions therein and on the need to employ more quantitative models (e.g., striped bass) during the Scoping Phase.

Our concerns over Suisun Marsh protection continue as they did in Exhibit WQCP-USFWS-5. It appears that the focus of the discussion in the Final Draft Plan now is upon endangered species to the exclusion of other fish and wildlife resources. The needs of the managed and unmanaged marshes of the Suisun Bay area must be considered carefully during the Scoping Phase of these Proceedings.

There is increasing emphasis in the Final Draft Plan upon what is not known about fish and wildlife resources rather than what is known. We are concerned that this emphasis means that the Board will not make a decision as to water quality and flow needs, rather than making decisions based upon what is known.

We are concerned with what we believe to be emphasis on structural alternatives in lieu of flow needs to protect beneficial uses of fish and wildlife. If in fact the need for flow is at a cost that the Board determines society cannot afford, then a determination of fact is needed before proceeding to accept a far less desireable alternatives.

We are confused as to why the Final Draft Plan was changed so significantly, expecially in its tone and stated commitments, from the June 1990 version. Many, if not most, of the changes seem to have been made independent of any testimony or exhibits offered during the August 1990 hearings.

Chapter 7 in particular has greatly changed since the June 1990 revised Draft Plan. A progression in refinement is not apparent, and further, the latest version, in our opinion, raises far more questions than it answers. In Chapter 7 in particular, it appears that the Board is moving from a water

right/water quality planning function to a project developer/operator function.

We look forward to the Scoping Phase and getting on with flow issues. We appreciate references in the Final Draft Plan as to how flow, operations and facilitities will be addressed in the Scoping and Water Rights Phases. That concludes my summary. If there are any questions, my colleagues and I are prepared to address them.

SPECIFIC COMMENTS

Page iii, para. 7: The last line should be changed to read as follows:...water quality and flow objectives in the Delta."

Page 1-6, para 1: More stable funding is needed for the overall Interagency Ecological Study Program, not only the Department of Fish and Game, to gain the data to be able to better manage the estuary.

Page 1-7, para 1: The example of a "reasonable measure" being a change in fishing regulations is a poor choice when fish populations are too low because of habitat damage rather than inappropriate fishing regulations.

Page 1-14, footnote 1: The logic that closure of the Delta Cross Channel gates causes entrainment in the south Delta is unclear. Rather, closure of the Delta Cross Channel gates under certain conditions benefits striped bass of Sacramento River origin. With gate closures and continued high exports, greater entrainment of San Joaquin origin striped bass occurs.

Page 1-14, para 1: Again, the Service wonders why the San Joaquin striped bass spawning objective cannot be expanded to Vernalis and later implemented if indeed it is a desireable action. As we stated in earlier testimony, we believe that desireable objectives should be set realizing that it may take time and varied actions to achieve implementation.

Page 1-17, para 1: The paragraph also needs to indicate how the temperature data is to be used.

Page 1-17, Estuarine Habitat, para 1: Past studies of estuarine habitat have identified the specific means to protect beneficial uses. Examples are Delta outflow, export curtailments, salinity regimes, hydraulic characteristics, water temperature, etc. The second sentence should be changed to read as follows: "Relatively few investigators have been able to specifically quantify the lower level of conditions that protects the beneficial uses."

Page 1-18, para 3: A goal of releasing 1,000,000 striped bass from grow-out facilities may not be sufficient to restore bass population in the near term. How was this goal determined? Needs to restore the striped bass population have been stated clearly in Exhibit WQCP-DFG-3.

Page 1-18, para 5: Board support for additional large-scale tests is good. However, the question remains as to how substantial these tests would be. For example, a large scale test involving spring-time export curtailments could

yield valuable information on production of young-of-the-year, and better define the role of confounding factors (e.g., contaminants, food supplies) in relation to bass production. The Service supports such a test.

Page 2-2, Section 2.2, Flow Considerations: It is stated that the reasonableness of a salinity objective can be evaluated by estimating the impact on water supplies. The reasonableness of an objective should be evaluated based on its impact to all beneficial uses, not just water supply. As stated, one might argue that water rights alone were being protected.

Page 5-1, Section 5.0, first para: To list the impacts of commercial and sport fishing as not fully defined influences on the Estuary, while failing to mention export pumping, is misleading as it is focusing on the least of the concerns. The Department of Fish and Game manages fishing with the best science available and in compliance with the California Environmental Quality Act. This entire paragraph seems out of place in this introductory paragraph on discussions of Water Quality Objectives. Items 1 through 4 on page 5-14, section 5.4.1, are far more appropriate to list here.

Page 5-1, Section 5.0.1, para 3: The second sentence states that "Objectives for the southern Delta await the implementation of a negotiated agreement between the South Delta Water Agency (SDWA), DWR, and USBR." The inference is that the negotiated agreement will be accepted as the South Delta Water quality objectives. The sentence should be reworded to read as follows: "Development of objectives for the South Delta will commence upon receipt of a negotiated agreement between..."

Page 5-14, Section 5.4, para 1: It is stated that "There is insufficient information in the record to set specific salinity and temperature objectives for the protection of Delta smelt, ..."

Since our testimony presented to you in August 1990, we have examined additional information which identified the salinity requirements of Delta smelt embryos and larvae. Delta smelt spawning occurs in fresh to slightly brackish water at temperatures of 7-15 °C (Moyle, Williams, and Wikramanayake 1989)[1/] and the pelagic larvae depend on the entrapment (or mixing) zone as a nursery area where a mean salinity of 2 grams per liter (parts per thousand, ppt) typically may be found. Adult Delta smelt occupy salinities ranging from 0-14 ppt (mean of 2 ppt), but rarely are found in salinities above 10-12 ppt (Moyle and Herbold, manuscript in preparation; Moyle, Williams, and Wikramanayake 1989). Analysis of environmental factors showed that the strongest correlation of high Delta smelt abundance with high phytoplankton and zooplankton productivity occurred when the entrapment zone was situated in the shallow waters of Suisun Bay (Moyle, Williams, and Wikramanayake 1989)[1/].

1/ Moyle, P.B., J.E. Williams, and E.D. Wikramanayake. 1989. Fish species of special concern of California. Final report prepared for State of California, Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California. 222pp.

The manuscript by Moyle and Herbold, submitted for publication to the Transactions of the American Fisheries Society, describes the Delta smelt to be a species adapted to life in the entrapment zone of the Sacramento-San Joaquin estuary. In that manuscript, the authors stated that, "When the entrapment zone is located in Suisun Bay, optimal conditions for smelt occupy a much larger total area that includes extensive shoal areas than they do when the entrapment zone is located in the Delta upstream." The river channels in the Delta are comparatively small in surface area and have few shoal areas, so are less favorable to the Delta smelt.

On June 29, 1990, the Service received a petition from the American Fisheries Society to list the Delta smelt as an endangered species with critical habitat. On December 24, 1990, the Service published that it found this petition request may be warranted (55 FR 52852). The Delta smelt has been a Service Category 1 candidate species since January 6, 1989 (54 FR 554), meaning the Service believes it has sufficient information to list the species.

Page 5-19, Section 5.5.2.1, para 2: Change the fourth line to read "...time periods encompass spawner migration and juvenile outmigration phases...". Also, the last line is misleading; Bureau of Reclamation temperature modelling shows that increased flow does reduce temperature.

Page 5-26, Section 5.5.3.2, para 1: A water temperature objective not exceeding 66°F between January 1 and March 31 in the lower Sacramento River for winter-run chinook salmon is inappropriate. The average water temperatures in this reach during the winter period range from less than 45°F to slightly over 60°F. We cannot envision when such an objective would be beneficial. Further, we do not know the temperature requirements of winter-run chinook salmon at that time and location. We do not support adoption of the stated objectives.

Page 5-27, Section 5.6, 3rd Bullet: It is stated "deficiencies in firm supplies and the level of protection afforded by the striped bass spawning objective should be correlated." The meaning of this statement is unclear.

Page 5-43, Section 5.10: Regarding Suisun Marsh objectives, we reiterate our comments contained in Exhibit WQCP-USFWS-5. In our opinion, the 10,000 plus acres of tidal marshes are not being addressed directly or indirectly in the Final Draft Plan. An explanation is needed as to why the Antidegradation Objectives (i.e., unamended 1978 objectives) as identified in the June 1990 Revised Draft Plan are no longer included as Potential Objectives (section 5.11.3) or as Alternative Objectives (Table 5.5). In regards to the need for additional facilities in the western part of Suisun Marsh, the Department of Water Resources held Scoping Meetings in 1990 on Phase 3 and 4 facilities, reflecting the known need for additional structures. The Final Draft Plan should have reflected these developments. The entire section 5.10 seems to infer that only rare, threatened, and endangered species require that their water quality needs be addressed. In our opinion, the waterfowl resources using the 10,000 plus acres of tidal marshes in Suisun Marsh need to have their water quality needs addressed as well.

Page 6-4, Section 6.2, para 1: Estimates of salmon survival apparently have been made but are not included in the Plan or Appendix 5.3. In section 6.2.3.4 (page 6-13) percentage differences in smolt survival are given only for Alternative 3. Actual smolt survival estimates should be provided in tabular form for comparison purposes, such as Table 6-2 accomplishes for water supply impacts.

Page 6-11, Section 6.2.2.4, Salmon: The text simply says "same as base", but the base (i.e., Section 6.2.1A) does not address salmon. This omission needs to be addressed.

Page 6-13, Section 6.2.3.4, para 1: The paragraph misleads the reader to think that a San Joaquin River flow increase of 21,000 acre feet over the spring period might lower water temperatures. These very small changes in flow afforded by Alternative 3 would not measurably affect water temperature. Further, to infer that such small increases in San Joaquin River flow would measurably benefit outmigrating smolts is wrong and should not be said.

Page 6-14, para 2 and 4: Under Striped Bass it is stated that "the increase in San Joaquin inflow under this alternative, combined with essentially no change in Sacramento River inflow and export levels, ..." yet under Water Supply it is stated, "this water is obtained by decreasing the total Delta exports and increasing the Delta inflows from both the Sacramento and San Joaquin River basins." Both of these apply to Alternative 3. The two statements are confusing and potentially contradictory. If there is a contradiction, it should be eliminated.

Page 6-20, Section 6.3.2, para 2 and 3: We agree with the concept that imprecise models can be used to compare relative differences in alternatives and various assumptions. We also agree that there is no valid basis for deferring use of currently available models as a tool in analysis of alternatives. Therefore, we recommend that in subsequent phases and in preparation of the EIR the sections on striped bass employ the best available models to provide quantified impact assessments.

Page 6-20, Section 6.3.3, para 3: It is our opinion that the text of the Final Draft Plan and the testimony of the Service and Department of Fish and Game supports the extension of the striped bass spawning objective to Vernalis, with qualifications as to its implementation.

Page 6-22, Section 6.5, para 3: The text states that the Board has concluded that the Plan will not have any significant or potentially significant effects. Does this mean that the water quality plan is in essence identical to 1978 Delta Plan, as the first bullet in section 6.4, page 6-20, infers? Does the environmental checklist (Table 6-5) refer only to the adoption of objectives or to their ultimate implementation? Implementation of objectives is impossible without the scoping and water rights phases taking place; the flow issue is not yet addressed.

Page 7-1, Section 7.1.1, Bullet #3: What is the Board's criteria for a negotiated agreement? Is it two or more parties agreeing? No parties objecting? What if negotiated agreements are not forthcoming? Some parties

and agencies have conflicting missions and compromise may not be possible. If negotiated agreements were a requirement of the process then, in theory at least, the Board would not be required to balance the protection of beneficial uses.

Page 7-11, Section 7.4.2.3, para 1: In the last line the concern for Sacramento River water temperature needs to be extended into June as it is the month of most acute temperature problems.

Page 7-11, Section 7.4.2.3, para 3: Winter-run chinook salmon have been noted from the Calaveras River, not the Cosumnes River.

Page 7-11 and 12, Section 7.4.2.3, para 4 and Bullets: The studies listed deal exclusively with smolt survival in the southern Delta. Are not the results of ongoing additional special studies to determine smolt survival on the Sacramento side of the Delta desired? See Exhibits WQCP-USFWS 2, 2a, and 3.

Page 7-14, Section 7.4.2.6A: Information needs under the California Endangered Species Act are addressed. On page 5-44 (last para) it is stated that "A biological assessment under both CESA and ESA is needed...". Care should be exercised to fully satisfy both acts.

Page 7-16, Section 7.4.3.2: Because this section addresses physical models only (hydraulic, hydrological, water quality, etc.) it should be so identified. Biological models need to be updated, improved and/or developed too. A section should be added to address these needs.

Page 7-16, Section 7.4.3.2.A: It is critical that the modelling studies be prioritized to achieve the most useful results for the Board's future decisions. Completion of the Bureau of Reclamation-funded San Joaquin River Operation Model is needed as soon as possible.

Page 7-20, Section 7.5.2.5, Export Recreation and Export Fishery Habitat: We are unable to reconcile the concern here for quite detailed information in the Scoping Phase and the relatively low level of concern expressed in Section 5.16. There seems to be considerable imbalance in Chapter 7.

Page 7-22, Section 7.5.3.3: The introductory paragraph on the entrapment zone, by including the phrase "if any" in relating the linkage of the entrapment zone and fish populations, fails to reflect the Phase 1 record. No qualification is needed; the statement should simply read as follows: "Studies are needed to better define the linkage between...".

Page 7-25, item 4, para 3: The delivery point of this facility alternative is noted as the "Tracy Pumping Plant", i.e., the Central Valley Project pumps. We suspect the intent was to deliver the water to the Clifton Court Forebay instead. Is this a simple mistake or is the statement accurate?

Page 5.3-1, para 2: The reference to the water temperature needs of spawning salmon and for egg incubation misuses USFWS Exhibits 29 and 31. Temperatures

not exceeding about 56°f, not 60°f, are necessary for salmon spawning and egg incubation.

Page 5.3-3, Table 5.3-1: The reference should be "WQCP-USFWS-1", not "WQCP-USFWS-O".

SUMMARY OF QUALIFICATIONS

Name:	Wayne S. White
Employer:	U.S. Fish and Wildlife Service Fish and Wildlife Enhancement Field Office 2800 Cottage Way, Room E-1803 Sacramento, California 95825-1846
Position:	Field Supervisor
Education:	B.A. and M.A. Biological Sciences California State University at Fullerton

Work and Professional Experience:

1974-1978,	Fish & Wildlife Biologist	FWS, Laguna Niguel, CA
1978-1984,	Fish & Wildlife Biologist	FWS, Portland, OR
1984-1988,	Supervisory Fish & Wildlife Biologist	FWS, Portland, OR
1988-1989,	Department of Interior Manager Development Program Participant	FWS, Washington, D.C.
1989-Present	Supervisory Fish & Wildlife Biologist	FWS, Sacramento, CA

WQCP-USFWS-8